Drawing requirements Notice

Vol. 887 Number 6

OFFICIAL GAZETTE

of the

UNITED STATES PATENT OFFICE

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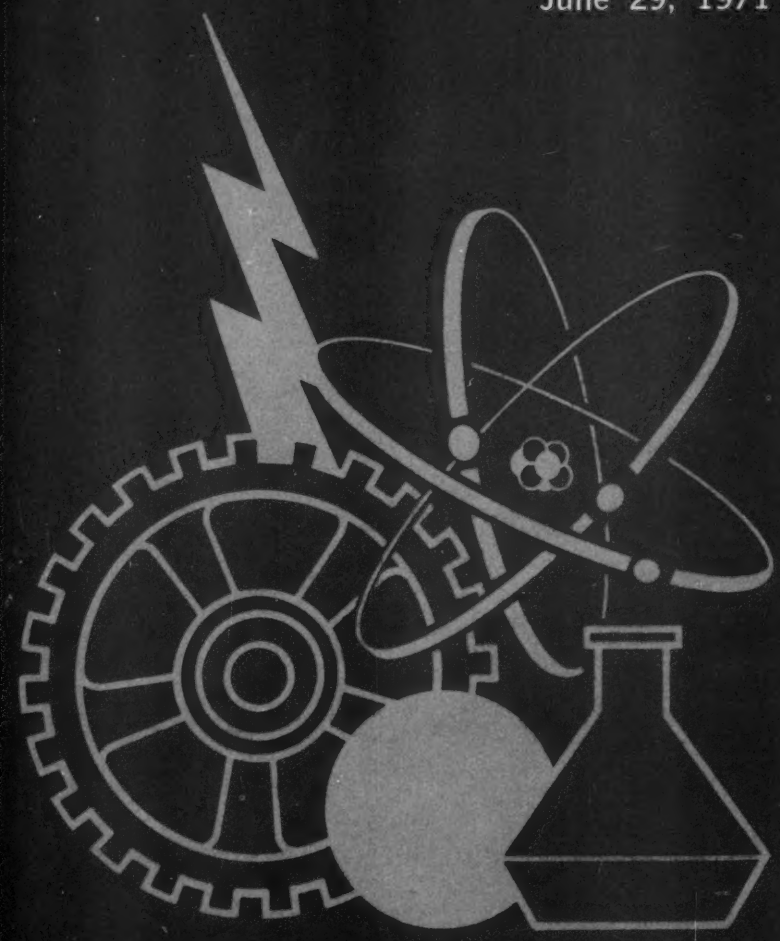
PATENTS

June 29, 1971



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Patent Office

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 29, 1971 Volume 887 Number 6

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

New Declaration Form

To facilitate electronic data input and to expedite processing of new patent applications, a new declaration form has been devised.

Single copies of the new form are available without charge for direct use or for reproduction purposes and may be picked up from the receptionist in Building No. 3 of the Patent Office at Crystal Plaza. Written requests for the form will be filled only if directed to the Commissioner of Patents, Office of Information Services, Washington, D.C., 20231. A stamped, self-addressed envelope must be enclosed.

RICHARD A. WAHL,
Assistant Commissioner.

May 28, 1971.

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

Drawing Requirements

These rule changes are intended to facilitate the handling and filing of patent application drawings in the Patent Office. Changing the drawing size to 8½ by 14 inches will permit filing of the original drawings in the application file wrapper in the Patent Office. The new size will also permit the use of standard storage equipment, mailing envelopes, and copying equipment.

The revised rules will prohibit the use of names within the "sight" of the drawing, thereby making additional space available for illustration and reducing the number of formal objections and corrections required.

Permanently mounted color photographs in plant patent applications will be accepted. This should result in substantial savings to applicant.

Since no names or other identification will be permitted within the "sight" of the drawing, applicants are expected to use the space above and between the hole locations to identify each sheet of drawings (note § 1.84(1)). This identification may consist of the attorney's name and docket number or the inventor's name and case number and may include the sheet number and the total number of sheets filed (for example, "sheet 2 of 4").

Notice of proposed rule making regarding revision of §§ 1.59, 1.84, 1.85, 1.123, and 1.165 and revocation of §§ 1.82 and 1.87 of Title 37, Code of Federal Regulations, relating to drawing requirements, was publishesd in the Federal Register of January 15, 1971 (36 F.R. 610). Interested persons were given an opportunity to participate in the rule making process through submission of comments in writing and at an oral hearing held on March 23, 1971.

Effective date. This revision shall become effective on the date of its publication in the Federal Register. However, until Jan. 1, 1972, drawings complying with the unrevised rules will also be accepted.

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), Title 37 of the Code of Federal Regulations is hereby amended as follows:

1. Section 1.59 is revised to read as follows:

§ 1.59 *Papers of complete application not to be returned.*

Papers in a complete application, including the drawings, will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost.

§ 1.82 [*Revoked*]

2. Section 1.82 is revoked.

3. In § 1.84 the introductory text preceding paragraph (a) and paragraph (h) are revoked and paragraphs (a), (b), (c), (j), and (l) are revised to read as follows:

§ 1.84 *Standards for drawings.*

(a) *Paper and ink.* Drawings must be made upon pure white paper of a thickness corresponding to two-ply or three-ply bristol-board. The surface of the paper must be calendered and smooth and of a quality which will permit erasure and correction with India ink, India ink, or its equivalent in quality, must be used for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not acceptable.

(b) *Size of sheet and margins.* The size of a sheet on which a drawing is made must be exactly 8½ by 14 inches. One of the shorter sides of the sheet is regarded as its top. The drawing must include a top margin of 2 inches and bottom and side margins of one-quarter inch from the edges, thereby leaving a "sight" precisely 8 by 11¾ inches. Margin boarder lines are not permitted. All work must be included within the "sight." The sheets may be provided with two ¼-inch-diameter holes having their centerlines spaced eleven-sixteenths inch below the top edge and 2¾ inches apart, said holes being equally spaced from the respective side edges.

(c) *Character of lines.* All drawings must be made with drafting instruments or by a process which will give them satisfactory reproduction characteristics. Every line and letter must be absolutely black and permanent; the weight of all lines and letters must be heavy enough to permit adequate reproduction. This direction applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. All lines must be clean, sharp, and solid, and fine or crowded lines should be avoided. Solid black should not be used for sectional or surface shading. Freehand work should be avoided wherever it is possible to do so.

* * * * *

(h) [*Revoked*]

* * * * *

(j) *Arrangement of views.* All views on the same sheet must stand in the same direction and should, if possible, stand so that they can be read with the sheet held in an upright position. If views longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the two-inch margin is on the right-hand side. One figure must not be placed upon another or within the outline of another.

* * * * *

(l) *Extraneous matter.* An inventor's, agent's, or attorney's name, signature, stamp, or address, or other extraneous matter, will not be permitted upon the face of a drawing, within or without the margin, except that identifying indicia (attorney's docket number, inventor's name, number of sheets, etc.) should be placed within three-fourths inch of the top edge and between the hole locations defined in paragraph (b) of this section. Authorized security markings may be placed on the drawings provided they be outside the illustrations and are removed when the material is declassified.

* * * * *

4. Section 1.85 is revised to read as follows:

§ 1.85 *Informal drawings.*

The requirements of § 1.84 relating to drawings will be strictly enforced. A drawing not executed in conformity thereto, if suitable for reproduction, may be admitted but in such case the drawing must be corrected or a new one furnished, as required. The necessary corrections or mounting will be made by the Office upon applicant's request or permission and at his expense. (See §§ 1.21 and 1.165.)

§ 1.87 [*Revoked*]

5. Section 1.87 is revoked.

6. In § 1.123, paragraph (a) is revised to read as follows:

§ 1.123 *Amendments to the drawing.*

(a) No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by the Office. A sketch in permanent ink showing proposed changes, to become

part of the record, must be filed. The paper requesting amendments to the drawing should be separate from other papers.

* * * * *

7. In § 1.165, paragraph (b) is revised to read as follows:

§ 1.165 *Drawings.*

* * * * *

(b) The drawing may be in color and when color is a distinguishing characteristic of the new variety, the drawing must be in color. Two copies of color drawings must be submitted. Color drawings may be made either in permanent water color or oil, or in lieu thereof may be photographs made by color photography or properly colored on sensitized paper. Permanently mounted color photographs are acceptable. The paper in any case must correspond in size, weight and quality to the paper required for other drawings. See § 1.84. Nonpermanently mounted copies will be correctly mounted at applicant's expense, § 1.21(1).

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Approved: May 25, 1971.

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 71-7504 Filed 5-27-71; 8:49 am]

Published in 36 F.R. 9774; May 28, 1971

Patent Application Branch Service

In order to expedite the processing of newly filed applications, improve the efficiency of the Office, and assist in the effort to normally dispose of patent applications within 18 months of their filing date, cooperation from the patent community is solicited with respect to recent procedural modifications.

Prior to examination concerning patentability, patent applications are now examined for compliance with formal requirements, and actions are mailed requiring correction of stated informalities. Many inquiries have arisen concerning the effect of such actions. Since the actions concerning correction of informalities include the setting of a period for response, failure to respond within the period set results in abandonment of the application.

Inquiries directed to the Application Branch, either in person or by telephone, concerning patent applications should not be made during the morning hours between 8:30 and 10:30.

The letter of transmittal accompanying the filing of continuing applications, particularly streamlined continuations and Rule 147 divisionals, should include such additional information as the identification by serial number of the parent application, its status, and location in the Patent Office. The supplying of this information will permit the processing of these new applications more rapidly than at present.

When a new application is filed with a request to transfer drawings under Rule 88, the application papers should include drawing prints to enable the Application Branch to process the case before transfer of the formal drawings is effected.

RICHARD A. WAHL,
June 1, 1971. *Assistant Commissioner.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,804,401, B. A. Cousino, MAGNETIC SOUND TAPE, **filed** July 6, 1966, D.C., S.D.N.Y., Doc. 66-C-1999, *Orrtronics, Inc.* v. *Audio Devices, Inc. et ano.* Stipulation, action dismissed pursuant to the provisions of Rule 41(a)(1) FRCP with prejudice, Jan. 29, 1971.

2,945,666, Freeman and Vaudreuil, BALL VALVE, **filed** Jan. 25, 1971, U.S. Ct., 1st Cir., Mass. (Boston), Doc. 71-1018, *Jamesbury Corporation* v. *Worcester Valve Company and E. W. Bliss Company.*

2,950,775, R. E. Zwayer, EXHAUST NOISE REDUCING AND AIR DIFFUSING MEANS FOR PNEUMATIC MOTORS, **filed** Feb. 12, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c414, *The Aro Corp.* v. *Allied Witan Company and Norman Eng. Co.*

2,962,837, J. H. Lemelson, TOY GUN CONTAINING RICHOCHET NOISE MECHANISM, **filed** Dec. 18, 1963, D.C., S.D.N.Y., Doc. 63-C-3663, *Jerome H. Lemelson* v. *De Luxe Reading Corp., Great Atlantic & Pacific Tea Co.* Judgment, against the plaintiff, dismissing the complaint, Jan. 20, 1971.

2,974,055, W. G. Scharf, LUSTROUS FABRICS AND METHODS OF PRODUCING SAME, **filed** Feb. 14, 1964, D.C., S.D.N.Y., Doc 64-C-508, *Metal Film Company* v. *Metlon Corp., Acme Backing Corp.* Opinion, plaintiff is entitled to judgment enjoining defendants and to an accounting for damages to which plaintiff is entitled; entry of such judgment is to be deferred until a determination of the misuse defense raised by defendants' counterclaim in a separate trial, July 27, 1970. Stipulation and order, action shall be terminated, without admission by any parties in accordance with the agreement as indicated, Jan. 20, 1971.

3,022,204, Muller and Albrecht, PROCESS FOR NITRIDING METALS, **filed** May 1, 1964, U.S. Ct. of App., 6th Cir., Cincinnati, Ohio, Doc. 20107, *Kolene Corporation, and Deutsche Gold- und Silber Scheideanstalt vormals Roessler* v. *Motor City Metal Treating, Inc.* Patent valid and infringed. The decision of the District Court is affirmed and remanded, decided Mar. 9, 1971.

3,055,014, H. W. Dozier, FULL FRONT SLIP, **filed** Feb. 6, 1967, D.C., S.D.N.Y., Doc. 67-C-508, *Fancee Free Manufacturing Company et ano.* v. *Leon-Roth Inc. et ano.* Consent judgment, defendants et al are restrained from making or selling any garments which are infringement of said patent. Defendants' counterclaims are dismissed, Feb. 3, 1971.

3,069,092, E. C. Norvell, LIQUID VAPORIZER, **filed** Aug. 2, 1965, D.C., E.D. Wis. (Milwaukee), Doc. 65-C-205, *Edmund C. Norvell, Jr., and Burgess Vibrocrafters, Inc.* v. *McGraw-Edison Company.* Order amending findings of fact and amended judgment filed July 29, 1970, ordered complaint be dismissed on the merits. Patent has not been infringed and that said patent is invalid, any person or entity entitled to enforce any alleged rights or privileges under said patent against the defendant is barred from attempting to assert any such rights or privileges, Feb. 19, 1971.

3,072,072, P. F. McDonough, OVERHEAD TRACK, **filed** Mar. 8, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71-C-255, *Computer Mechanisms Corp.* v. *Tally Corp.*

3,079,935, T. Padek, AUTOMATIC CLEANING SYSTEM, **filed** July 19, 1968, D.C., S.D. Tex. (Houston), Doc. 68-H-619, *Detergent Engineering Corporation* v. *Bill McDavid Oldsmobile, Inc.* Consent judgment, patent valid and infringed, Feb. 16, 1971.

3,096,148, W. Walker, Jr., ARTICLE STERILIZING, DEODORIZING AND ACCOUNTING PROCESS AND APPARATUS, **filed** Feb. 22, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71-C-196, *Willis Walker, Jr., M.D.* v. *C. R. Bard, Inc., W. H. Andersen Products, Inc.*

3,103,736, C. E. Ortman, Jr., CUTTING TOOL AND MILLING HEAD INSERT THEREFOR, **filed** Aug. 26, 1965, D.C., N.D. Ill. (Chicago), Doc. 65c1430, *Charles E. Ortman, Jr.* v. *Standard Railway Equipment Manufacturing Company, Div. of Stanray Corp.* Judgment for defendant against plaintiff under second (contract) cause of action, Dec. 19, 1969. Mandate U.S.C.A., order of Dec. 19, 1969 is reversed and cause is remanded for further proceedings, Mar. 2, 1971.

3,134,118, J. H. Chouinard, LAWN SWEEPER ATTACHMENT, **filed** Nov. 9, 1970, D.C.N.J. (Newark), Doc. 1499-70, *Schering Corporation* v. *Moore-Kirk Laboratories, Inc.* Consent judgment for permanent injunction, Feb. 4, 1971.

3,149,431, M. B. Blish, SELF-ALIGNING NECK CARD LABEL, **filed** Feb. 16, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c424, *Matthew B. Blish* v. *Colgate-Palmolive Co.*

3,152,895, Stoertz and Goodwin, UTILIZATION OF BARK FLY ASH AND LIKE MATERIALS, **filed** Apr. 29, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c1011, *Westvaco Corporation* v. *City of Chicago, City Hall, and Timerland Products Co., Inc.* Stipulation order complaint hereby dismissed without prejudice, Oct. 7, 1970.

3,190,405, R. K. Squire, EXTENDABLE SHORE, **filed** Feb. 11, 1971, D.C., N.D. Ohio (Toledo), Doc. C71-45, *Bliss & Laughlin Industries Inc.* v. *Bil-Jax, Inc.*

3,204,517, R. Looker, BLIND FASTENER, **filed** Mar. 2, 1971, D.C., E.D. Mich. (Detroit), *Huck Manufacturing Co.* v. *Textron, Inc.* (Stipulation to *Amend* Patent No.)

3,298,039, J. Schmerler, SWIMMING POOL COPING, **filed** Feb. 3, 1971, D.C.N.J. (Newark), Doc. 148–71, *Major Pool Equipment Corp.* v. *Heldor Associates, Inc.*

3,309,256, R. Warsager, APPARATUS FOR SURFACE DECORATING OF ARTICLES, **filed** July 17, 1969, D.C., S.D.N.Y., Doc. 69–C–3129, *Rubin Warsager* v. *Melrose Sales Corp.* Notice of dismissal pursuant to Rule 41(a)(1)(i), Nov. 13, 1970.

3,314,715, L. J. Bontrager, TRAVEL TRAILER, **filed** May 22, 1969, D.C., N.D. Ind. (South Bend), Doc. 69–S–97, *Starcraft Company, Div. of Bangor Punta Operations, Inc.* v. *Ski-Tow Manufacturing Co., Inc. and Charles H. Young.* Stipulation, consent judgment against Ski-Tow Mfg. Co., defendant infringed, Feb. 6, 1971.

3,318,854, Honn and Sims, FLUORINATED ELASTOMERIC COPOLYMERS, **filed** June 13, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c1260, *Minnesota Mining and Manufacturing Co.* v. *E. I. du Pont de Nemours & Co., Inc.* Cause dismissed, judgment for defendant, Aug. 25, 1970.

3,323,528, G. G. Link, SPRAYING TYPE ETCHING MACHINE FOR PRINTING PLATES, **filed** Jan. 6, 1970, D.C., E.D. Wis. (Milwaukee), Doc. 70–C–5, *George G. Link* v. *Mueller Color Plate Co.* Stipulation of dismissal with prejudice, Jan. 5, 1971.

3,344,993, Wilder, Swenson and Fyrk, SPREADER APPARATUS, **filed** Apr. 13, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c881, *Swenson Spreader & Mfg. Co.* v. *Ambac Industries, Incorporated.* Consent judgment, patent valid, defendant not to manufacture except under license, Mar. 3, 1971.

3,353,115, T. H. Maiman, RUBY LASER SYSTEMS, **filed** Feb. 16, 1971, D.C. Del. (Wilmington), Doc. 4065, *Hughes Aircraft Company* v. *Holobeam, Inc.*

3,353,478, S. Hopkins, WASTE COLLECTING AND COMPACTING UNIT, **filed** Apr. 20, 1970, D.C. Md. (Baltimore), Doc. 70–455–K, *Whirlpool Corporation* v. *Trash Masters Corporation et al.* Stipulation, complaint dismissed without prejudice, Feb. 16, 1971.

3,358,319, Hillenbrand and Fullenkamp, MONOCURTAIN SCREENING SWITCH, **filed** Mar. 1, 1971, D.C.N.J. (Camden), Doc. C–279–71, *Hill-Rom Company, Inc.* v. *Beltor Manufacturing Corporation.*

3,454,273, E. M. Vogt, EXERCISE DEVICE OF THE TWIST BOARD TYPE, **filed** Dec. 23, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c2641, *General International Industries, Inc.* v. *Montgomery Ward & Co., Incorporated.* Stipulation for dismissal, Dec. 7, 1970.

3,518,099, E. Holbus, PROTECTIVE COATING FOR METAL SURFACES, **filed** Feb. 5, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C–54, *Edward Holbus* v. *Edick Industries, Inc., and R. J. Shelstad.*

Re. 25,595, Schwab, Beale and Anderson, PRINTED CIRCUIT BOARD FILE, **filed** Feb. 2, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–253–WPG, *A. W. Schnitger* v. *Canoga Electronics Corp.*

D. 212,372, Trimble and Rottman, GOAL POST, **filed** Mar. 5, 1971, D.C., N.D. Tex. (Wichita Falls), Doc. CA–7–627, *Triman Tele-Goal, Inc.* v. *Wichita Falls Independent School District.*

Certificates of Correction for the Week of June 29, 1971

D. 219,711	3,544,335	3,556,377	3,563,354
3,336,918	3,544,698	3,556,553	3,563,527
3,360,396	3,545,241	3,556,652	3,563,599
3,377,492	3,545,836	3,556,864	3,563,690
3,410,670	3,546,034	3,557,007	3,563,714
3,449,973	3,546,559	3,557,054	3,563,838
3,452,300	3,546,618	3,557,106	3,563,992
3,463,252	3,546,627	3,557,317	3,564,136
3,485,683	3,547,841	3,557,347	3,564,319
3,486,928	3,547,980	3,557,427	3,564,438
3,507,920	3,547,997	3,557,741	3,564,615
3,510,294	3,549,712	3,557,798	3,564,984
3,512,963	3,549,734	3,557,807	3,565,288
3,519,033	3,549,752	3,557,931	3,565,385
3,521,269	3,549,894	3,558,512	3,565,855
3,526,878	3,550,485	3,558,861	3,565,913
3,529,358	3,550,514	3,558,953	3,566,012
3,531,525	3,550,806	3,559,587	3,566,096
3,535,225	3,551,031	3,559,937	3,566,102
3,535,463	3,551,210	3,559,955	3,566,131
3,536,697	3,551,262	3,560,106	3,566,151
3,536,757	3,552,308	3,560,237	3,566,244
3,537,488	3,552,546	3,560,453	3,566,296
3,537,720	3,552,950	3,560,548	3,566,379
3,537,962	3,552,984	3,561,202	3,567,663
3,538,195	3,552,993	3,561,319	3,567,857
3,538,368	3,553,208	3,561,536	3,567,860
3,540,294	3,553,561	3,561,611	3,568,042
3,541,150	3,553,652	3,561,799	3,568,942
3,541,577	3,554,057	3,561,845	3,568,968
3,542,527	3,554,160	3,561,991	3,570,358
3,542,606	3,554,305	3,562,327	3,570,399
3,542,751	3,554,606	3,562,493	3,571,847
3,542,796	3,554,892	3,562,595	3,571,872
3,543,011	3,555,879	3,562,989	3,572,622
3,543,179	3,555,912	3,563,108	

Service by Publication

Larry K. Clark

In accordance with Rule 47(b) of the Rules of Practice of the United States Patent Office in Patent Cases, notice is hereby given of the filing on August 20, 1968, of applications for patent entitled "Multi-Phase Traffic Control System," and "Apparatus for Allocating and Timing a Plurality of Load Intervals," on behalf of Larry K. Clark, whose last known address is 917½ West Locust St., Davenport, Iowa. These applications were made in compliance with Rule 47(b) and 35 U.S.C. 118 by E. W. Bliss Company without execution by the said Larry K. Clark. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Larry K. Clark in connection with the said applications must be taken within thirty days of the publication of this notice.

RICHARD A. WAHL,
Assistant Commissioner of Patents.

Disclaimers

2,944,899.—*Rudolph E. Damschroder* and *Herbert B. Cowden*, Rochester, N.Y. STABILIZATION OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS. Patent dated July 12, 1960. Disclaimer filed Mar. 3, 1971, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claims 1, 2 and 5 of said patent.

3,359,744.—*Carl A. Bolez*, Allentown, and *John A. Pryor*, Emmaus, Pa. HYDROGEN PURIFICATION SYSTEM WITH SEPARATED VAPOR AND LIQUID MIXED TO PROVIDE A HEAT EXCHANGE MEDIUM. Patent dated Dec. 26, 1967. Disclaimer filed Feb. 17, 1971, by the assignee, *Air Products and Chemicals, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,495,222.—*Pier Giorgio Perotto*, Turin, and *Giovanni De-Sandre*, Sacile, Italy. PROGRAM CONTROLLED ELECTRONIC COMPUTER. Patent dated Feb. 10, 1970. Disclaimer filed Mar. 17, 1971, by the assignee, *Ing. C. Olivetti & C., S.p.A.*

Hereby enters this disclaimer to claims 3, 4 and 6 of said patent.

3,512,982.—*Robert C. Taber*, *William H. Russell*, and *Charles A. Goffe*, Rochester, N.Y. NUCLEIC ACIDS AS FOG STABILIZERS FOR PHOTOGRAPHIC EMULSIONS. Patent dated May 19, 1970. Disclaimer filed Apr. 5, 1971, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claims 1 through 12 inclusive.

Patents Available for Licensing or Sale

3,518,446. ELECTROSTATIC ENGINE. Motoyoshi Nakanishi. Correspondence to: Ernest Montague, 122 E. 42nd St., New York, N.Y., 10017.

3,535,747. DETACHABLE INTERCHANGEABLE CUFF LINKS. Robert M. Benn, 6904 106 B Ave., Edmonton, Alberta, Canada.

3,549,223. POLYMERIC BEARING FOR PAPER MAKING MACHINES. Sinclair Company, Holyoke, Mass. Correspondence to: Chapin, Neal and Dempsey, Third National Bank Bldg., Springfield, Mass., 01103.

3,563,595. RESILIENT BUMPER GUARD FOR MOTOR VEHICLES. Coleman M. Slavney, 580 Egret Drive, Hallandale, Fla. 33009.

3,565,179. SOD-TRIMMING DEVICE FOR SPRINKLER HEADS. Alvin E. Paliant, Fullerton, Calif. Correspondence to: W. Britton Moore, 531 Little John, Sherwood Forest, Md., 21450.

3,568,283. METAL CUTTING TOOL. Edgar Wyss, Correspondence to: Verenigte Drahtwerke AG. Biel, Neumarktstrasse 33, 2501 Biel, Switzerland.

3,570,477. PARALYTIC ACTIVATING MACHINE. John V. Scrivner, Star Rte. 5, Box 209, Rye, Colo.

3,571,839. APPARATUS FOR REMOVING THE EXCESS MATERIAL OBTAINED WHEN TRIMMING THE TOP SIDE OF PLASTIC FOAM CONCRETE BLOCKS. Josef Vogele, et al. Correspondence to: Woodhams, Blanchard & Flynn, 2026 Rambling Road, Kalamazoo, Mich., 49001.

3,572,680. MACHINE TOOL TABLE. Frederick R. Neff, 2993 Curtis Ave., D26, Des Plaines, Ill., 60636.

3,572,720. GOLF PUTTING PRACTICE DEVICE. Edward T. Berg, 187 Fremont St., San Francisco, Calif., 94105.

3,572,295. ANIMAL SECURING GATE. Cecil L. Tansel, Rte. 4, Box 165, Chandler, Okla., 74834.

3,572,312. ARCHERY BOW WITH SLING ATTACHMENT. Merle L. Foster, 401 School, Iowa Falls, Iowa, 50126.

3,575,309. ON AND OFF CARGO LOADING MECHANISM. Wyatt B. Peterson, 1003 Tanglewood Drive, Clinton, Miss., 39056.

3,576,037. ARTIFICIAL BREASTS. Margaret Klein, 179—15 Kildare Road, Jamaica Estates, N.Y., 11432.

3,576,374. PENCIL OPERATING MECHANISM. Leila J. Lile, 5076 Elmwood Drive, San Jose, Calif., 95130.

3,584,592. YACHTCAR. Albert D. Perrine, 955 NW. 4th Ave., Homestead, Fla., 33030.

The following patent is available for licensing by the Department of Health, Education, and Welfare as provided by Title 45 C.F.R. Section 6.3.

Inquiries should be addressed to Mr. Norman J. Latker, Chief, Patent Branch, % National Institutes of Health, Rm. 5A03, Westwood Bldg., Bethesda, Md., 20014.

3,577,267. METHOD OF PREPARING BLOOD SMEARS.

General Electric Company is prepared to grant non-exclusive licenses under the following 30 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Patent Counsel, Metallurgical Products Department, General Electric Company, Box 237–GPO, Detroit, Mich. 48232.

3,551,991. INFILTRATED CEMENTED CARBIDES.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Power Transmission Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,561,942. APPARATUS FOR FEEDING MOLTEN GLASS.

Applications for license under the following patent may be addressed to: Patent Counsel, Telecommunication Products Department, General Electric Company, Lynchburg, Va., 24502.

3,564,456. CIRCUIT FOR PRODUCING FREQUENCY-MODULATED SIGNALS.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa., 19101.

3,556,834. LOW TEMPERATURE METHOD FOR PRODUCING AMORPHOUS BORON-CARBON DEPOSITS.

Applications for license under the following 2 patents may be addressed to: Patent Counsel, Industry Control Products Department, General Electric Company, 1501 Roanoke Blvd., Salem, Va., 24153.

3,222,283. LEAD BARIUM NIOBATE CERAMIC COMPOSITION.

3,343,080. PULSING GROUND FAULT DETECTOR APPARATUS.

Applications for license under the following 23 patents may be addressed to: Patent Counsel Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,248,799. AUTOMATIC DRYER CONTROL CIRCUIT.

3,248,800. AUTOMATIC DRYER CONTROL CIRCUIT.

3,286,936. SUPPORTING STRUCTURE FOR WASTE DISPOSAL APPARATUS.

3,288,302. RACK SUPPORT SYSTEM.

3,306,319. WATER TAKEOFF FOR WASHING MACHINE CONNECTOR.

3,364,941. CHECK VALVE.

3,419,190. TREATING AGENT DISPENSING MEANS FOR AUTOMATIC WASHING MACHINE.

3,419,192. TREATING AGENT DISPENSER FOR AUTOMATIC WASHING MACHINE.

3,421,660. DISPENSING MEANS FOR WASHING APPLIANCE.

3,423,138. THRUST BEARING.

3,425,651. MOTOR-PUMP SUPPORT MEANS AND METHOD OF ASSEMBLY.

3,426,944. TREATING AGENT DISPENSER FOR AUTOMATIC WASHING MACHINE.

3,431,395. ELECTRIC WATER HEATER CIRCUIT.

3,434,671. PUMP FOR DISHWASHER.

3,477,058. MAGNESIA INSULATED HEATING ELEMENTS AND METHODS OF PRODUCTION.

3,535,010. PROPULSION SYSTEM FOR DOMESTIC APPLIANCE.

3,543,605. CNTROL KNOB WITH ADJUSTABLE CONNECTION MEANS.

3,546,435. PURE SOLID STATE SELF-CLEANING OVEN CONTROL.

3,555,242. DISHWASHER HAVING IMPROVED HEATING MEANS.

3,556,625. RACK ASSEMBLY FOR A FRONT-OPENING DISHWASHER.

3,559,889. DISHWASHER WITH IMPROVED MEANS FOR REDUCING LIQUID CARRYOVER.

3,560,069. ADJUSTABLE RACK ASSEMBLY IN AN AUTOMATIC DISHWASHER.

3,567,906. PLANAR SURFACE HEATER WITH INTEGRAL FASTENERS FOR HEATING ELEMENT.

Applications for license under the following patent may be addressed to: Patent Counsel, Home Entertainment Business Division, General Electric Company, Bldg. 1, Electronics Park, Syracuse, N.Y., 13201.

3,122,610. CIRCUITRY FOR MULTIPLEX TRANSMISSION OF FM STEREO SIGNALS WITH PILOT SIGNAL.

Erratum

All references to Patent No. 3,586,876 to George R. Cogar, Address Counter Stage Circuitry, appearing in the OFFICIAL GAZETTE of June 22, 1971 should be deleted as the application was withdrawn from issue and the patent was not issued.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 15, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-22-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-01-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-17-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-09-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	10-01-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-20-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-01-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-02-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	2-17-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-23-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	5-01-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	3-02-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-03-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	7-09-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	3-03-70

Expiration of patents: The patents within the range of numbers indicated below expire during June 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,679,645 to 2,682,657, inclusive
Plant Patents ..... Numbers 1,282 to 1,287, inclusive

REISSUES

JUNE 29, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,148

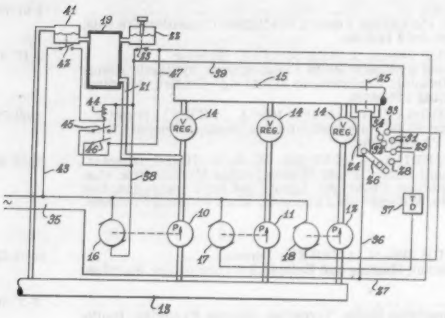
WATER PRESSURE BOOSTER SYSTEM

Robert F. Schaub, La Grange, Ill., assignor to Schaub Engineering Company, Downers Grove, Ill.

Original No. 3,369,489, dated Feb. 20, 1968, Ser. No. 483,646, Aug. 30, 1965. Application for reissue Feb. 19, 1970, Ser. No. 12,683

Int. Cl. F04b *41/06, 49/00*

U.S. Cl. 417—6 8 Claims



A water pressure system combining a hydro-pneumatic tank and a plurality of mechanical pumps to provide continuous constant water pressure at all taps throughout the system regardless of tap size or elevation. The pumps are in a parallel arrangement between the water source and a pressure regulated discharge conduit. One of the pumps provides water to the hydro-pneumatic tank for low demand situations. The others pumps are activated as the demand rises. Low demands are satisfied by the hydro-pneumatic tank without activating the mechanical pumps. The system substantially eliminates unwanted pressure fluctuations.

27,149

CARTRIDGE REPEATER PENCIL

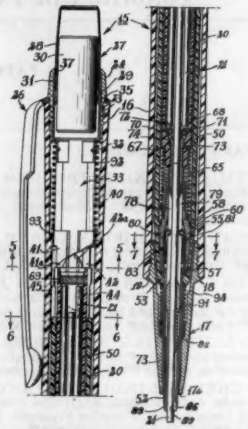
Daniel Parker, Janesville, Wis., assignor to The Parker Pen Company, Janesville, Wis.

Original No. 3,437,413, dated Apr. 8, 1969, Ser. No. 573,240, Aug. 18, 1966. Application for reissue Apr. 3, 1970, Ser. No. 25,420

Int. Cl. B43k *21/16, 21/22*

U.S. Cl. 401—67 10 Claims

A writing instrument includes a throw-away pencil cartridge comprising a tubular barrel having an actuator assembly slidably mounted in its rearward portion and a self-contained pencil cartridge removably mounted in its forward portion. The self-contained cartridge includes a tubular shell for supporting a lead supply chamber and a lead advancing mechanism is operating engagement with the actuator assembly.



27,150

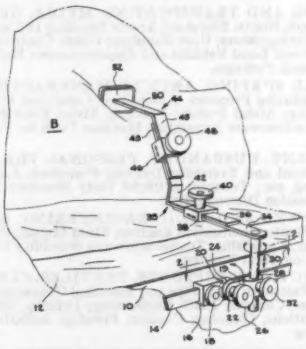
DEVICE FOR PREVENTING HYPOTENSION SYNDROME OF LATE PREGNANCY

Roland L. Kennedy, 4639 Farmington Road, Toledo, Ohio 43623

Original No. 3,389,702, dated June 25, 1968, Ser. No. 532,328, Mar. 7, 1966. Application for reissue Dec. 26, 1968, Ser. No. 799,137

Int. Cl. A61b *17/42*

U.S. Cl. 128—361 5 Claims



A device for maintaining normal blood pressure during late pregnancy comprising a pad for engaging the body of a woman to displace the uterus to the left to prevent the inferior vena cava from compression to permit normal cardiac output. Linkage means are provided to interconnect the body engaging pad with the side rail of an operating table to enable adjustment of the pad relative to the patient.

27,151

CARBOXY-HYDROXY-CONTAINING COPOLYMERS

Darrell D. Hicks, Louisville, Ky., assignor to Celanese Coatings Company, New York, N.Y.

No Drawing. Original No. 3,375,227, dated Mar. 26, 1968, Ser. No. 544,083, Apr. 21, 1966, which is a continuation-in-part of Ser. No. 364,274, May 1, 1964. Application for reissue Mar. 24, 1970, Ser. No. 22,409

The portion of the term of the patent subsequent to Oct. 3, 1978, has been disclaimed

Int. Cl. C08f *15/40*

U.S. Cl. 260—47UA 2 Claims

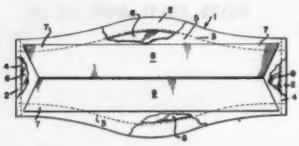
A copolymer of an unsaturated aliphatic acid having only one carboxy group, at least one different ethylenically unsaturated monomer and a beta-hydroxyalkyl ester of an unsaturated aliphatic acid having only one carboxyl group, said copolymer being useful in coating compositions.

PATENTS

GRANTED JUNE 29, 1971

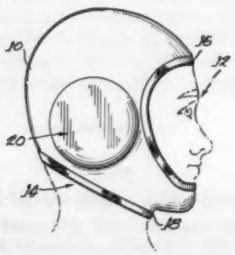
GENERAL AND MECHANICAL

3,588,913
SADDLE FOR GARMENT STRAPS
Le'lla E. Ewing, 224 Eden Park, Gleneden Beach, Oreg. 97388
Filed Dec. 22, 1969, Ser. No. 886,850
Int. Cl. A41d *13/00*
U.S. Cl. 2—2 2 Claims



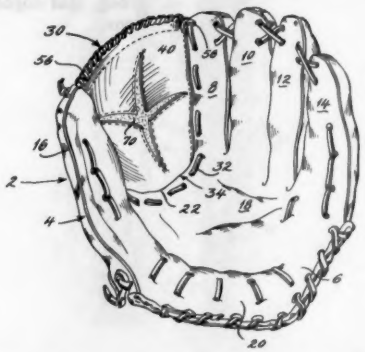
Saddles for shoulder straps for brassieres. The saddles are laminated and identical. Each saddle includes a base laminate comprising a length of soft padding to which is secured by stitching a matching length and width of relatively thin plastic material which renders the base self-conforming to the shoulder of the wearer. Two opposing, parallel, flexible, strap-engaging members are secured to the base by stitching inwardly for a short distance from their outer ends to render the members flexible throughout their length with the base, and also independently flexible relative to the base. The strap-engaging members are of a single thickness of clear plastic material.

3,588,914
PROTECTIVE SPORTS HEADGEAR
George Ihnat, Jr., 10809 Oak Park Ave., Worth, Ill. 60482
Continuation-in-part of application Ser. No. 832,693, June 12, 1969. This application Nov. 13, 1969, Ser. No. 876,304
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 9 Claims



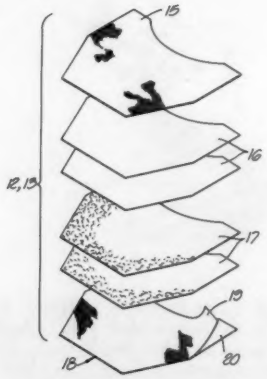
This protective headgear for protecting the outer ear against physical injury while engaged in sports such as wrestling comprises a resiliently stretchable headpiece with face and neck apertures and pockets over the ear locations for removable ear protectors, e.g., outer rigid plates and interior annular cushions, or one-piece resilient ear pads.

3,588,915
BALL GLOVE HAVING A CONCAVE BACKSTOP
Roland N. Latina, Belleville, Ill., assignor to Rawlings Sporting Goods Company, St. Louis, Mo.
Filed Jan. 30, 1970, Ser. No. 7,188
Int. Cl. A41d *13/10*
U.S. Cl. 2—19 10 Claims



A ball glove has a first finger section and a thumb section with a flexible backstop connected to and closing the area between those sections. The backstop is formed from similarly-shaped and overlying facing and backing plies each of which is internally slitted to permit expanding the ply into a three dimensional configuration. Means is secured in the plies so that the slits are prevented from closing. Thus, the three dimensional configuration of concave shape for the backstop is maintained.

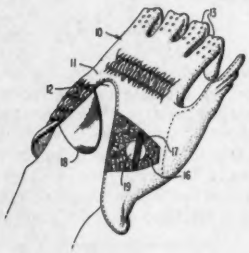
3,588,916
UNDERARM SHIELD
Linda R. Glatt, 2759 Monte Mar Terrace, Los Angeles, Calif. 90064
Filed Mar. 10, 1969, Ser. No. 805,748
Int. Cl. A41d *27/12*
U.S. Cl. 2—53 2 Claims



A pair of identical shield halves are secured to one another along an edge to form a one piece shield which

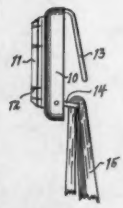
is located in the armpit region of a garment. Strips of adhesive on the outer surface of each of the shield halves secures them to the garment. Each shield half includes inner absorbent layers, an outer waterproof layer on which the adhesive strips are located and an outer layer at the other side of the absorbent material of a generally porous character. The latter layer, which is to contact the skin, is non-pillable and does not irritate or chafe. The two halves are joined together along a common edge, leaving the ends of the common edge unjoined such that the gaps along the line of joinder serve as guides when placing the shield in the garment.

3,588,917
GOLF GLOVE
Anthony John Antonious, 108 Greenway Drive, Ellicott City, Md. 21043
Filed July 9, 1969, Ser. No. 840,347
Int. Cl. A41d *19/00*
U.S. Cl. 2—161 **12 Claims**



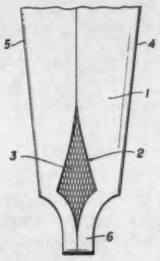
A golf glove that provides a taut fit on the palm and fingers by providing elastic means across the knuckles of the glove that cooperate with a fastener. A deep vent opening can be provided on the back portion to permit easy entry of the hand. The glove can be adjustably fastened upon the hand by one or more Velcro nylon tabs which can be directly attached to one side of the deep vent opening or can be attached through a ring with a flexible strap to provide a double closure. The palm portion of the glove can be provided with a reinforced pad and vent perforations. An additional pad can be extended between the webbing of the thumb and index finger to ensure protection for other sports. A ball marker can be locked into the Velcro tab fastener or separately attached to the glove.

3,588,918
NECKTIE SUPPORTING BROACH
Harry C. Thistle, 2227 San Jose Ave., San Francisco, Calif. 94112
Filed Mar. 23, 1970, Ser. No. 21,600
Int. Cl. A41d *25/08*
U.S. Cl. 2—153 **1 Claim**



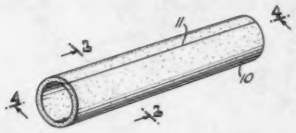
A necktie supporting broach having a neckband engaging loop and a necktie supporting member positioned in drilled openings in the back of a non-metallic backing member. A semi-precious stone is mounted on the front face of the backing member.

3,588,919
SKI PANTS
Eric Georg Selzer, Vienna, Austria, assignor to E. G. Selzer Erzeugung von Sportbekleidung Gesellschaft m.b.H., Vienna, Austria
Filed Apr. 23, 1969, Ser. No. 818,698
Claims priority, application Austria, Jan. 23, 1969, A 707/69
Int. Cl. A41d *1/08*
U.S. Cl. 2—227 **3 Claims**



Ski pants include a leg portion having an area in the vicinity of the location of the ankle which is made of elastic material. The area comprises a central rhombic portion which is formed by slitting away the material of the ski pants and joining the slit-away portions by elastic material, which may, for example, comprise an elastic cloth with threads which intersect and provide elastic support in at least two directions.

3,588,920
SURGICAL VASCULAR PROSTHESES FORMED OF POLYESTER FIBER PAPER
Sigmund A. Wesolowski, 44 Roosevelt Ave., East Rockaway, N.Y. 11518
Filed Sept. 5, 1969, Ser. No. 855,585
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **3 Claims**

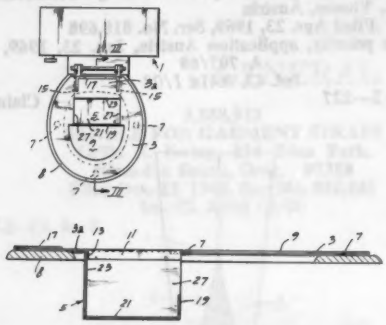


Vascular prostheses characterized by a porosity of from about 550 cc. to 8,000 cc. per minute per square centimeter are constructed of polyester fiber paper having a thickness of from about 64 microns to about 254 microns. The mechanical handling properties are excellent and the residual patency of the implanted prostheses following healing is superior to polyester prostheses having a woven or knit structure.

3,588,921
TOILET MOUNTED DISPOSABLE STOOL SPECIMEN COLLECTOR
Theodore C. Nagel, 315 N. Maple Ave., Oak Park, Ill. 60302
Filed Oct. 9, 1969, Ser. No. 865,104
Int. Cl. E03d *13/00*; A47k *11/00*
U.S. Cl. 4—1 **9 Claims**

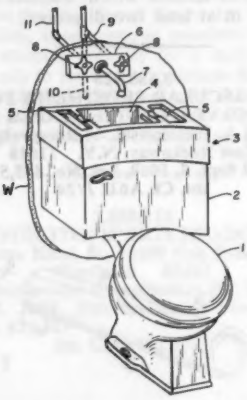
A combination toilet seat cover and stool specimen collector made of paper, plastic, or other collapsible or foldable material. The specimen collector is attached to the seat cover at the rear end so as to leave a front opening for urine to pass directly into the toilet. The specimen collected depends into the toilet from the seat cover a

distance shorter than normal water level in the toilet. The under-side of the seat cover is provided with means for pressure adhering the cover to the toilet seat.



Perforated lines are provided in the seat cover so that the specimen holder containing the specimen can be easily separated from the toilet seat cover.

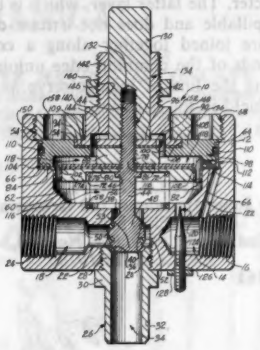
3,588,922
LAVATORY-WATER CLOSET COMBINATION
Joseph P. Carfora, 226 Northmount Drive, Verona, Pa. 15147
Filed Sept. 10, 1969, Ser. No. 856,621
Int. Cl. A47k *4/00*
U.S. Cl. 4—3 **4 Claims**



A lavatory for mounting on a flush tank of a toilet such as used in a powder room or other room involving very limited space. The lavatory replaces the lid of the flush tank and is completely separate from a water faucet connection thereabove to hot and cold water pipes located behind a wall, so as to enable the lavatory to be lifted independently of the faucet when repairs in the flush tank are necessary.

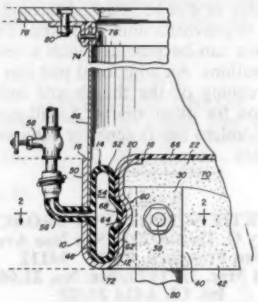
3,588,923
PRESSURE TRANSFER VALVE
Elmer A. Haglund, 700 Poinsettia Ave., Del Mar, Calif. 92625; Ivan L. Marburger, 1315 Tulare Way, Upland, Calif. 91876; and Donald W. Howell, 1627 Victoria Place, La Verne, Calif. 91750
Filed Oct. 16, 1969, Ser. No. 867,043
Int. Cl. E03d *3/00*; G05d *7/00*
U.S. Cl. 4—26 **20 Claims**

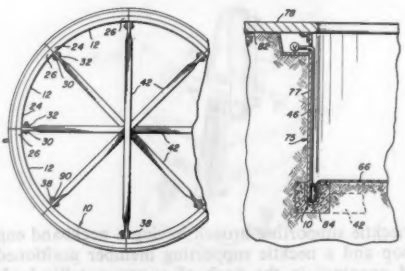
A pressure transfer valve has a flexible pressure responsive diaphragm disposed between a lower pressure chamber and an upper pressure chamber. A valve inlet port connected to a source of fluid under pressure communicates with each pressure chamber, and a valve outlet port communicates with the lower pressure chamber through an upper valve seat. A manually operative movable plunger carried by the diaphragm is sealed at the upper valve seat so that both pressure chambers are initially subjected to inlet pressure. A valve vent port having a lower valve seat communicates with the outlet



port. Movement of the plunger to the lower valve seat permits fluid under pressure to flow through the outlet port to a downstream system. When outlet pressure builds up to a predetermined value sensed by the diaphragm, the plunger automatically returns to its upper valve seat and the outlet pressure exhausts through the vent port. The downstream system can include a flush control pump connected to a toilet system.

3,588,924
SWIMMING POOL CONSTRUCTION
Adam D. Goettl, P.O. Box 10036, Phoenix, Ariz. 85016
Filed Feb. 24, 1970, Ser. No. 13,720
Int. Cl. E04h *3/16*
U.S. Cl. 4—172.19 **11 Claims**

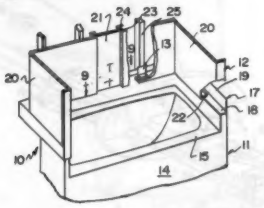




A swimming pool construction adapted for above-ground or recessed installation wherein an endless base

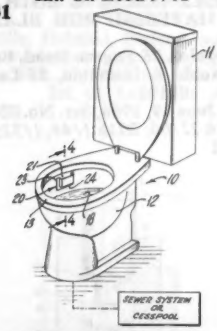
channel assembly is provided with tension braces extending thereacross and wherein an inflatable seal is disposed between one side of the channel assembly and an upstanding water retaining wall to surround and retain water in a swimming pool area.

3,588,925
BATHTUB AND WALL ENCLOSURE
Norbert T. Kuypers, Lake Orion, Mich., and Callis B. Niquette, Jr., Mansfield, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Nov. 21, 1968, Ser. No. 777,627
Int. Cl. A47k *3/14, 3/00*
U.S. Cl. 4—173 **2 Claims**



A bathtub and three piece tub enclosure are disclosed herein and are generally of the type that are supported on the floor and against a wall of a bathroom. The pieces of the enclosure are adapted to be watertight with respect to each other and the enclosure as a whole is assembled on the tub to be watertight with respect to the tub. Also, disclosed herein are means for securing the tub and enclosures together and to secure said tub and enclosure to the wall.

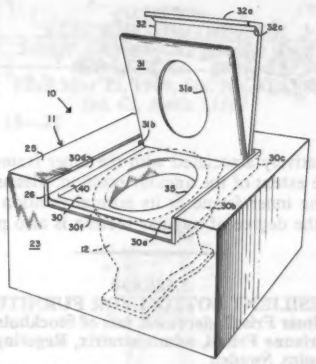
3,588,926
HOLDER FOR DEODORANT TABLETS
Fred H. Buck, Jr., Boonton Township, Morris County, N.J., assignor to Arrowhead Industries, Morris, N.J.
Continuation-in-part of application Ser. No. 830,762, June 5, 1969. This application Sept. 9, 1969, Ser. No. 864,255
Int. Cl. E03d *9/02*
U.S. Cl. 4—231 **15 Claims**



A holder for attachment to the wall of a urinal, toilet or the like, which is adapted to hold deodorizing and germicidal compounds and is mounted so that influent water will be introduced thereinto and will be discharged therefrom with a portion of the compounds dissolved therein.

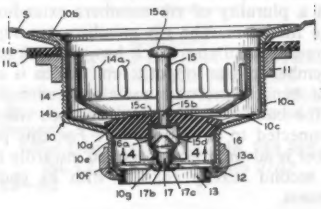
3,588,927
TOILET UNIT
Clarence A. Springer, P.O. Box 761, Sunnyvale, Calif. 94088
Filed Aug. 2, 1968, Ser. No. 749,769
Int. Cl. A47k *13/00*
U.S. Cl. 4—239 **7 Claims**

A toilet unit adapter for installation in a cabinet or the like that is fittable over and supported by an existing floor mounted closet bowl wherein the toilet unit adapter comprises an integral incurvature sink with a hinged toilet seat and toilet seat cover mounted in the incurvature sink. The seat and cover swing downwardly in flush relative



with said incurvature sink. The incurvature sink facilitates securing said toilet unit adapter to the closet bowl and existing plumbing. The toilet unit adapter, being so supported, can be easily removed from a closet bowl for maintenance and the like.

3,588,928
COMBINED DRAIN STRAINER AND STOPPER
Arthur J. Hiertz, Moultrie, Ga., assignor to National Distillers and Chemical Corporation, New York, N.Y.
Filed Sept. 11, 1969, Ser. No. 857,077
Int. Cl. A47k *1/14*
U.S. Cl. 4—287 **6 Claims**



A combined sink strainer and stopper assembly with resilient means carried by the strainer basket and engageable with rigid means carried by the strainer housing for securing the stopper in drain closing position upon depression of the strainer basket assembly.

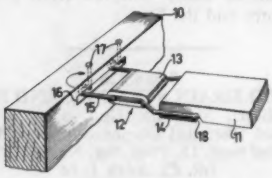
3,588,929
ADJUSTABLE TILTING DEVICE FOR USE WITH BEDS OR THE LIKE
Le Roy C. Blomberg, 101 Sherman Ave., New York, N.Y. 10034
Filed Apr. 18, 1969, Ser. No. 817,415
Int. Cl. A61g *7/10*
U.S. Cl. 5—62 **10 Claims**

The invention is directed to an adjustable tilting assembly for use with beds or the like having an outer frame with the inner frame contained therein for supporting the user of the device between a normal level position and an inclined position, which positions may be reached

while the user remains on the bed with a minimal of effort on his part. Means is provided for tiltably supporting the inner frame on a transverse axis for angular movement with control means coupled to the outer frame

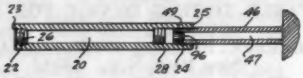
and operatively associated with the inner frame for regulating the extent of the angular position. Means for maintaining the inner frame in its normal position as well as limiting the degree of angular motion is also provided.

3,588,930
RESILIENT BOTTOM FOR FURNITURE
Erik Hjalmar Frisell, deceased, late of Stockholm, Sweden, by Marianne Frisell, administratrix, Regeringsgatan 83, Stockholm, Sweden
Filed Mar. 29, 1968, Ser. No. 717,475
Claims priority, application Sweden, Mar. 30, 1967, 4,379/67
Int. Cl. A47c *23/06*
U.S. Cl. 5—238 **7 Claims**



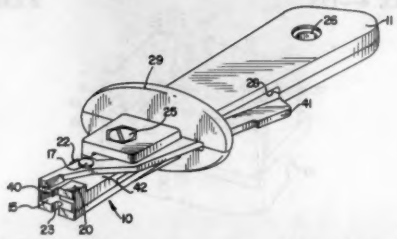
A resilient support or bottom for furniture such as a bed or chair comprises laterally spaced side frame members with a plurality of rib members extending between the frame members. The rib members are supported by a first non-elastic stirrup which has one end secured to a frame member and an opposite end which is engaged by an elastic band. A second non-elastic stirrup is looped through the band and it has end portions which are pivotally connected to a rib member. For this purpose the rib member is advantageously slotted inwardly from a side and the second stirrup engages with its ends into the slotted recess.

3,588,931
COMBINATION TOOL DEVICE
Richard L. Jones, 2614 E. Routt, Pueblo, Colo. 81004
Filed July 25, 1969, Ser. No. 844,827
Int. Cl. B25f *1/02*
U.S. Cl. 7—8.1 **13 Claims**



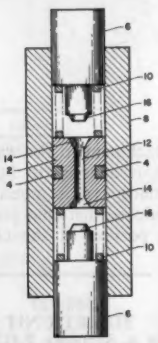
A combination tool device readily disassembled into compact components for positioning in a belt-worn carrying pouch. The device comprises an elongated tubular handle having a storage compartment therein for protecting matches or the like. Also provided are closure means at one end of said handle, a plurality of attachments securable at either end of said handle; one of said attachments comprising a combination axe-hammer head, another attachment comprising a combination knife-saw head.

3,588,932
INSERTION TOOL FOR CLIP TYPE TERMINAL
William S. Sedlacek, Chicago, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.
Filed Aug. 22, 1969, Ser. No. 852,408
Int. Cl. B25f *1/00*
U.S. Cl. 7—14.1 **7 Claims**



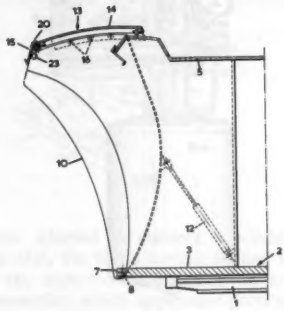
A tool for inserting wire into the slot of a clip type terminal has a cut-off blade pivotally mounted on a side surface of the elongate tool member. The end surface of the tool has a recess for receiving the upper end of the terminal. Notches at the front edges of the tool serve to locate the wire across the recess during operation. The edge of the chisel-type cutting blade is longitudinally disposed and moves across a notch and cooperates with an anvil projecting from said surface so that the free end of the wire located in the notches can be severed at the end of the insertion operation.

3,588,933
METHOD AND APPARATUS FOR SIMULTANEOUSLY UPSET FORMING BOTH ENDS OF A DUCTILE MATERIAL ROD BLANK OR THE LIKE
George J. Shinopulos, 25 Eugene Road, Burlington, Mass. 01803, and Noble E. Hamilton, 35 Ledgewood Road, Weston, Mass. 02193
Filed June 19, 1968, Ser. No. 738,219
Int. Cl. B21d *22/00*; B21k *1/44, 1/52*; B23g *9/00*
U.S. Cl. 10—12 **7 Claims**



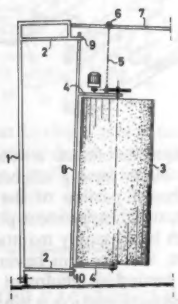
Simultaneous upset forming both ends of a ductile rod or the like without the necessity of a clamping means for holding the rod securely is accomplished by the method and apparatus described.

3,588,934
END SECTION FOR AN AIRPORT JETTY
Nicolaas Gradus Jan Willem van Marle, Dordrecht, Netherlands, assignor to Aviolanda Maatschappij voor Vliegtuigbouw N.V., Papendrecht, Netherlands
Filed May 23, 1969, Ser. No. 827,299
Claims priority, application Netherlands, May 29, 1968, 6807580
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 8 Claims



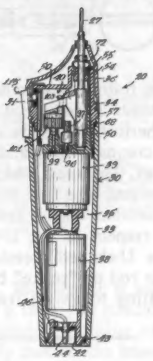
An end section for an airport jetty, adapted to engage with the fuselage of an aircraft, said end section having side elements pivotable independently of each other about an axis virtually coinciding with the forward lower edge of the section, and a roof supported by said side elements to be moved along with their pivoting movements, characterized in that the roof consists of a rearward plate member slidably secured to the end of each of said side elements, and a forward rocking member pivoted to said plate member, said rocking member comprising the forward upper edge of the end section, the ends of said forward edge being flexibly secured to said side elements.

3,588,935
APPARATUS FOR WASHING MOTOR CARS AND THE LIKE
Jouko V. Anttila, Helsinki, Finland, assignor to Auto-R. Lamminen Oy, Tampere, Finland
Filed Feb. 27, 1969, Ser. No. 802,842
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 10 Claims



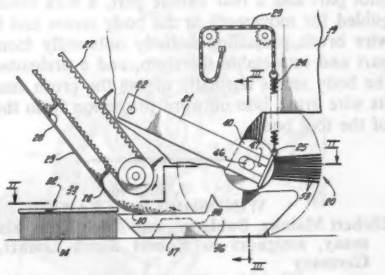
Apparatus for washing motor cars, comprising a frame providing an inner area for a car to be washed in the apparatus, a horizontal brush, at least one pair of vertical brushes, and optionally a pair of side brushes, preferably combined with means for administering a washing fluid to the brushes. The vertical brushes are supported so that their bearings can alternately be swivelled about two separate vertical axes, of which one axis is always in advance of the rotational axis of the respective vertical brush, with respect to the direction of movement of the apparatus along the car during the washing procedure. Two preferred embodiments are described.

3,588,936
ELECTRIC TOOTHBRUSH
John P. Duve, 8625 Parkview Ave., Brookfield, Ill. 60513
Filed May 13, 1969, Ser. No. 824,110
Int. Cl. A46b *13/02*
U.S. Cl. 15—22 10 Claims



An electric cordless toothbrushing device having a power handle with a drive shaft extending from one end thereof and a toothbrush attachment which is securable to the remote end of said shaft. The power handle includes a battery powered motor which by means of a motion converting mechanism drives the shaft so that the rotary power of the motor is translated to an orbital motion at the toothbrush attachment. An improved electric switch is provided to control the energization of the motor.

3,588,937
STREET SWEEPING BROOM CONSTRUCTION WITH INCLINED BRISTLES
Donald E. Scruggs, Chino, and Charles E. Holmes, Huntington Beach, Calif., assignors to Industrial Brush Company, Pomona, Calif.
Filed Dec. 5, 1968, Ser. No. 781,395
Int. Cl. E01h *1/02*; A46b *9/02*
U.S. Cl. 15—82 11 Claims



A street and industrial sweeper broom construction having brush filaments arranged to smoothly and uniformly sweep a surface without the presence of streaks throughout the length of the broom and at surface areas beyond core ends of the broom and extending to dirt and debris

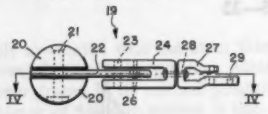
guide means on a sweeping machine, said broom construction being readily reversible to obtain maximum wear and having filaments inclined longitudinally to provide continuous effective novel surface sweeping action.

3,588,938

LEADING END FITTING FOR SEWER CLEANING RODS AND THE LIKE

Camillo Guerrini, R.D. 2, Greenville, Pa. 16125

Filed Dec. 26, 1968, Ser. No. 787,131
Int. Cl. B08b 9/02
U.S. Cl. 15—104.3 2 Claims



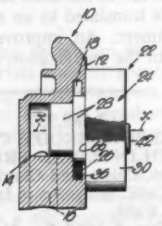
Disclosed in the following specification is an improved end fitting for a sewer cleaning rod or "plumber's snake." A pair of hemispherical rollers are mounted for free rotation about their common axis and with their flat faces toward one another. The shaft which carries these rollers is mounted at one end of a link which is in turn carried by a U-shaped member and is free to pivot through a limited arc with respect to the U-shaped member. The closed end of the U-shaped member is attached to the end of the flexible rod or "snake" by a connection which allows the end fitting to swivel freely about the axis of the flexible rod.

3,588,939

GASKET SEAT CLEANING TOOL

Gerald L. Luongo, 10 Deborah Lane, East Haven, Conn. 06512

Filed Sept. 30, 1969, Ser. No. 862,251
Int. Cl. A46b 7/02
U.S. Cl. 15—160 5 Claims



A tool for cleaning the annular gasket-seating groove in a cylindrical opening in an air coupling member, with the tool having a recessed body with a cylindrical front pilot part and a rear handle part, a wire brush assembly guided for movement in the body recess and including a wire brush projecting radially outwardly from the pilot part and retractable thereinto, and a preloaded spring in the body recess normally urging the brush assembly with its wire brush into outward projection from the pilot part of the tool body.

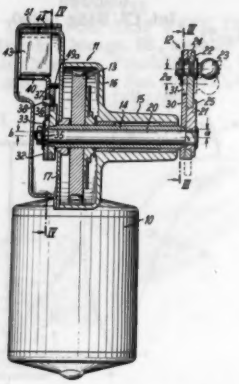
3,588,940

WINDSHIELD CLEANER

Hubert Mainka, Buhlertal, and Erich Kolb, Eisental, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 28, 1969, Ser. No. 880,548
Claims priority, application Germany, Nov. 30, 1968, P 18 17 960.3
Int. Cl. B60s 1/08; F16h 21/40
U.S. Cl. 15—250.17 17 Claims

A windshield cleaner wherein the blades move back and forth in response to rotation with and move to and from parking positions in response to radial movements of a crank pin relative to a hollow shaft which is driven by an electric motor. A second shaft is rotatable in the hollow shaft and the crank pin receives motion from a crank arm including an eccentric on the second shaft, a strap surrounding the eccentric and carrying the crank pin, and



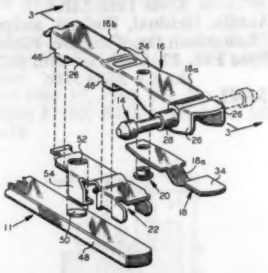
a plate which is rigid with the hollow shaft and is coupled with the strap in such a way that the latter rotates the rank pin about the axis of the hollow shaft when the two shafts rotate as a unit and that the crank pin moves radially of the hollow shaft when the latter rotates with reference to the second shaft.

3,588,941

CONNECTOR FOR WINDSHIELD WIPER BLADE AND ARM

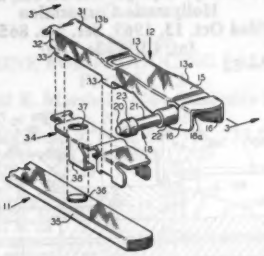
Frank J. Schlesinger, Merrillville, Ind., assignor to The Anderson Company

Filed Feb. 16, 1970, Ser. No. 11,380
Int. Cl. A47l 1/00; B60s 1/40
U.S. Cl. 15—250.32 1 Claim



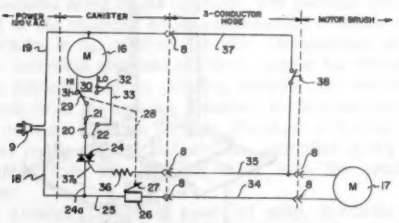
A connector adapted to connect a windshield wiper blade and an arm, the blade having aligned apertures in the sides of the uppermost portion of the arm pressure distributing assembly, which uppermost portion is adapted to receive a pin which is releasably maintained against transverse displacement, and the arm having a straight outermost end portion having an abutment thereon. The connector has, at its forward portion, a pin which has an outer portion that extends transversely outwardly so that it can enter the uppermost portion of the arm pressure distributing assembly of the blade and be engaged releasably therein. The inner portion of the pin is releasably held so that the direction in which the outer portion extends outwardly can be reversed. The straight end of the arm can be inserted in the aft end of the connector and is releasably held therein.

3,588,942
CONNECTOR FOR WINDSHIELD WIPER ARM AND BLADE
Frank J. Schlesinger, Merrillville, Ind., assignor to The Anderson Company
Filed Nov. 19, 1969, Ser. No. 878,148
Int. Cl. A47l 1/00; B60s 1/40
U.S. Cl. 15—250.32 2 Claims



A connector adapted to connect a windshield wiper blade and an arm, the blade having aligned apertures in the sides of the uppermost portion of the arm pressure distributing assembly, which uppermost portion is adapted to receive a pin which is releasably maintained against transverse displacement, and the arm having a straight outermost end portion having an abutment thereon. The connector has, at its outer end, a fixedly secured pin which extends transversely outwardly so that it can enter the uppermost portion of the arm pressure distributing assembly of the blade and be engaged releasably therein. The straight end of the arm can be inserted in the inner end of the connector and is releasably held therein.

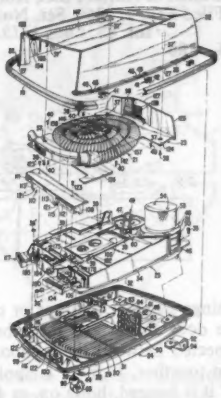
3,588,943
VACUUM CLEANER SUCTION AND BRUSH CONTROL
Thomas E. Hetland, St. Paul, Minn., assignor to Whirlpool Corporation
Filed Nov. 12, 1968, Ser. No. 774,919
Int. Cl. A47l 5/36
U.S. Cl. 15—327 7 Claims



A vacuum cleaner having a motor fan suction unit and a floor contacting motor brush unit with a switch preferably adjacent to the handle used for propelling the motor brush unit over the floor being cleaned with this switch controlling current flow to both of the motors.

3,588,944
CANISTER VACUUM CLEANER
Charles T. Fromknecht and Martin E. Harbeck, Anderson, S.C., assignors to The Singer Company, New York, N.Y.
Filed Jan. 8, 1970, Ser. No. 1,489
Int. Cl. A47l 5/36, 9/14
U.S. Cl. 15—327 7 Claims

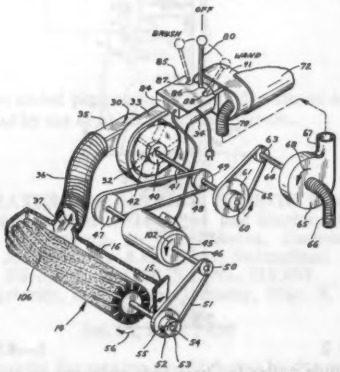
A vacuum cleaner of the canister variety for domestic use having lower and upper housings secured together by U-shaped clips, and an intermediate housing. Between the upper and intermediate housings is disposed a hose storage compartment within which the hose is retracted and stored by a hose reel mechanism upon depression of a foot pedal. A dust bag, located within the vacuum chamber between the intermediate and lower housing, is attached to a bracket on an access door located at the bottom of the lower housing. To change the filter bag, and a pair of secondary filters which are also removably



mounted on the door, the cleaner is set on end and the access door opened to a table-like position. A front panel, mounted on the intermediate housing and secured to the lower housing, operably mounts the hose retraction pedal, the power switch pedal, the suction/blower levers and a filter bag change indicator. Also disclosed is a selectively operable lever controlled slide valve for converting the cleaner from suction to blower operation and vice versa.

3,588,945
SURFACE MAINTENANCE MACHINE
Keith N. Krier, Minneapolis, and Donald J. Haub, Champlin Township, Minn., assignors to Tennant Company, Minneapolis, Minn.
Filed June 13, 1969, Ser. No. 832,926
Int. Cl. A47l 5/28
U.S. Cl. 15—332 12 Claims

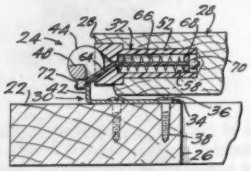
A surface maintenance machine using a tool such as a brush, and having a first vacuum blower for receiving dust and debris from the brush, and having a separate vacuum blower for remote use with a hand held cleaning wand. Electrical switching and air valving controls are operated from a single hand control so that alternately the brush and its associated vacuum blower will



be driven from a single motor, and when the control is in another position the brush and its associated vacuum

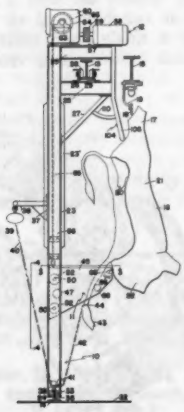
blower will not be power driven from the motor, but the motor will drive the second vacuum blower for use with the hand held wand.

3,588,946
HINGE
Robert D. MacDonald, Adrian, Mich., assignor to Cardinal of Adrian, Inc., Adrian, Mich.
Filed Feb. 7, 1969, Ser. No. 797,506
Int. Cl. E06f *1/12*
U.S. Cl. 16—180 **7 Claims**



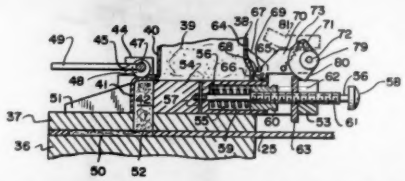
A door hinge has two portions or components, one affixed to the door frame and the other to the door with means connected between the components for resiliently urging them together. If force is applied to the door, for example, if it is banged, hung on, or forced open too far, the two hinge portions will yieldably separate to minimize damage to the door, the frame, the hinge, or all three. The hinge also is designed to urge the door shut when it is partly open and further, to urge the door beyond the closed position, when closed, so that no latch is needed for the door. The new hinge has other advantages over previously known latchless door hinges in that the new hinge is self-aligning, imparts no resistance as the door is being opened, and can urge the door toward the closed position when opened at a wider angle than heretofore.

3,588,947
HIDE PULLER
John Devlin and G. Alfred Giessmann, Lethbridge, Alberta, and William D. Gosset, Toronto, Ontario, Canada, assignors to Canada Packers Limited, Toronto, Ontario, Canada
Filed Apr. 22, 1969, Ser. No. 818,360
Int. Cl. A22b *15/16*
U.S. Cl. 17—21 **21 Claims**



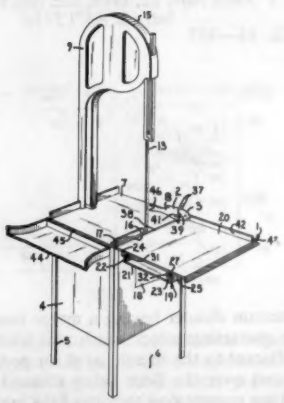
A hide puller for beef hide stripping on the rail which consists of a roll assembly reciprocating vertically in a carriage with a driven eccentric roller in the roll carriage engaging between the hide and the back of the carcass thus stripping the hide from the carcass as the roll assembly moves upwardly.

3,588,948
MOLDING DEVICE FOR PLASTIC MATERIAL
James A. Holly, Olympia Fields, Ill., assignor to Hollymatic Corporation
Filed Oct. 13, 1969, Ser. No. 865,628
Int. Cl. A22c *7/00*
U.S. Cl. 17—32 **15 Claims**



Molding apparatus for molding or shaping portions such as pattties of a moldable material such as a food material in which a movable feeder in a hopper is operated for forcing successive portions of material from the hopper into a shaping mold opening and with improved means for retaining the feeder in fixed position, applying pressure to the material until the mold opening has been moved out of material receiving position and for releasing the retaining means after the mold opening has been moved out of this position.

3,588,949
APPARATUS FOR REMOVING FISH HEADS
Howard F. Heck, 107 W. 7th St., Lawrence, Kans. 66044
Filed July 22, 1969, Ser. No. 843,475
Int. Cl. A22c *25/14*
U.S. Cl. 17—63 **6 Claims**

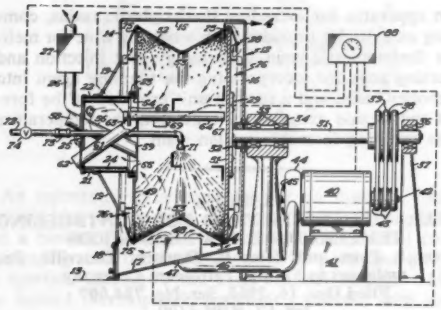


An apparatus for removing fish heads by cutting transversely through the fish at a location to include the gall bladder within the severed head portion thereof has a movable member for supporting a head portion of the fish and pectoral fin engaging members on the movable member to position the head portion relative to a cutter whereby, when the fish and the movable member are moved toward and beyond the cutter, the head portion is severed.

A method of removing fish heads as a step in the dressing of fish comprises pulling a fish by the tail to move

rear sides of pectoral fins into firm engagement with spaced upright rods thereby holding a head portion in a fixed position while moving the fish into engagement with cutting means to sever the head portion from a body portion of the fish at a location substantially on a plane adjacent said pectoral fins whereby the gall bladder is in the head portion removed from the fish body.

3,588,950
MACHINE FOR PRODUCING LAUNDRY PRODUCTS
Donald E. Marshall, 4904 Sunnyside Road, Edina, Minn. 55424
Filed Nov. 5, 1968, Ser. No. 773,585
Int. Cl. B22d *13/00*
U.S. Cl. 18—2.5 **29 Claims**

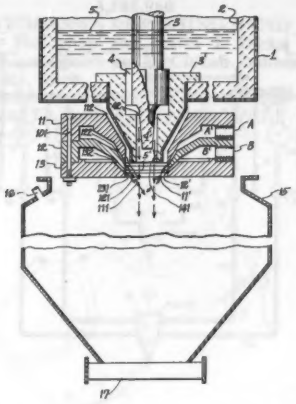


An improved machine and method for producing a laundry product comprising generally spherical beads formed from particles of soap, synthetic detergent, or the like. In the machine and method of this invention, the particles are formed into an annular fluidized bed of particles and gas in a rotatable chamber as a result of relatively high speed rotation of the chamber and continuous introduction of gas into the rotating chamber. Periodically the particles are tumbled in the chamber by abruptly reducing the rotational speed of the chamber. The particles may be treated in the chamber by the introduction of fluids onto the particles in the rotating chamber. The machine of the present invention also includes novel means for introducing the particles into the rotating chamber, for removing the beads from the rotating chamber, for introducing gas under pressure into the rotating chamber to fluidize the particles in the annular bed, and for recirculating the gas exhausted from the chamber back into the rotating chamber.

The generally spherical beads of soap, synthetic detergent or the like produced by the machine and method of this invention are relatively dense, have a relatively low moisture content and may include one or more outer layers or coatings of solidified treating fluid, with each bead containing substantially the same materials and proportion of materials as are in the other beads.

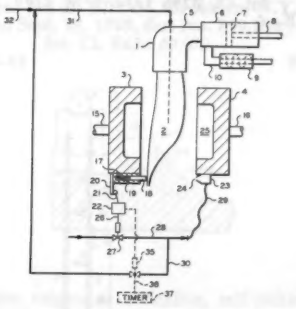
3,588,951
FRACTIONAL DISINTEGRATING APPARATUS
William G. Hegmann, 204 NE. 4th St., Sandoval, Ill. 62882
Filed Nov. 8, 1968, Ser. No. 774,428
Int. Cl. B22d *23/08*
U.S. Cl. 18—2.5 **14 Claims**

A system for producing comminuted material wherein a stream of molten material is subjected to high pressure fluid blasts which break the material into particles which will solidify when cooled. The specific improvement of the invention involves the provision of nozzle means for directing a first blast onto an exposed surface of a moving stream of molten material. The nozzle means includes at least one additional outlet for directing additional blasts



onto the exposed surface of the moving stream at a point downstream of the first contact. Means are provided for regulating the stream to facilitate the formation of satisfactory product.

3,588,952
APPARATUS FOR SEALING PARISON WITH FLUID STREAM
Newton R. Wilson and Thomas J. Nave, Bartlesville, Okla., assignors to Phillips Petroleum Company
Original application May 29, 1967, Ser. No. 641,812, now Patent No. 3,479,420, dated Nov. 18, 1969. Divided and this application July 1, 1969, Ser. No. 838,264
Int. Cl. B29c *5/06*
U.S. Cl. 18—5 **4 Claims**

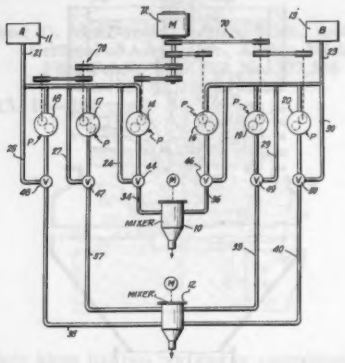


An open ended parison to be molded is closed adjacent its open end by use of at least one fluid stream.

3,588,953
APPARATUS FOR MAKING PLASTIC FOAMS
Franz Gottfried Reuter, Hannover, and Gunter Friedrich Bartel, Tecklenburg, In den Lehmen, Germany, assignors to Elastomer A.G., Chur, Switzerland
Filed Mar. 6, 1968, Ser. No. 710,903
Claims priority, application Germany, Mar. 8, 1967, E 33,545
Int. Cl. B29c *1/00*
U.S. Cl. 18—5 **8 Claims**

An apparatus for making plastic foams having a plurality of means for mixing components of a foamable reaction mixture together, each mixing means being connected to each supply of components by its own metering pump

or pumps, all pumps of the apparatus being driven at the same speed for the same period of time while charging



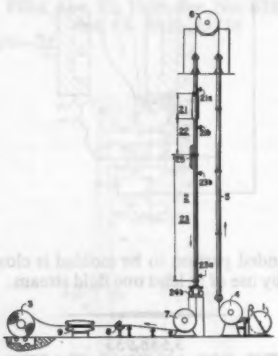
components to the mixing means so that any variation of volume of components is effected by the size of the pump.

3,588,954

CONTINUOUS CROSSLINKING DEVICE FOR RUBBER OR PLASTIC CABLE

Yoichi Nakamura, Kamakura-shi, Michio Fukuda, Yokohama-shi, Hirokazu Miyauchi, Higashiosaka-shi, and Yasuo Wakabayashi, Settsu, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 12, 1968, Ser. No. 751,979
Claims priority, application Japan, Aug. 10, 1967, 42/68,448; Aug. 11, 1967, 42/51,189, 42/68,830, 42/68,831, 42/68,832, 42/68,833; Aug. 12, 1967, 42/69,208
Int. Cl. B29h *5/24, 5/26, 5/28*
U.S. Cl. 18—6 **9 Claims**



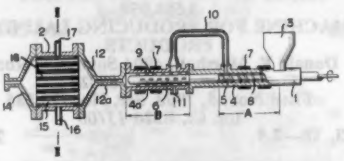
Conventional steam curing chamber employed in the curing system of electric cable insulation material, such as rubber and plastic, is replaced by a crosslinking tube having a radiant heating zone, a pre-cooling zone, and a cooling zone arranged in this order between a cable feeding device and a take-up device. The inside of the radiant heating zone and the pre-cooling zone is filled with an inert gas which does not oxidize the rubber or plastic covering of the cable.

3,588,955

EXTRUDING APPARATUS

Kimikazu Azuma, 3–18 Matsugaoka, 3-chome, Kugenuma, Fujisawa-shi, Kanagawa-ken, Japan

Filed Sept. 27, 1968, Ser. No. 763,243
Claims priority, application Japan, Aug. 21, 1968, 43/59,129
Int. Cl. B29f *1/02, 1/04, 1/08*
U.S. Cl. 18—12 **6 Claims**



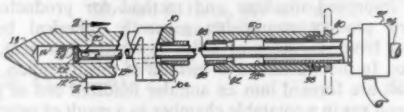
An apparatus for extruding thermoplastic resins, comprising an extruder provided with a heating zone for melting a thermoplastic resin, a foaming agent injection and dispersing zone for incorporating the foaming agent into the molten resin, and a cooling unit provided at the foremost end of said extruder for regulating the temperature of the resulting foamable molten resin.

3,588,956

APPARATUS AND METHOD FOR CONTROLLING TEMPERATURE IN A FEED SCREW

Robert J. Poux and Peter R. Deutsch, Titusville, Pa., assignors to Phillips Petroleum Company

Filed Dec. 16, 1968, Ser. No. 784,007
Int. Cl. B29f *3/00*
U.S. Cl. 18—12 **4 Claims**



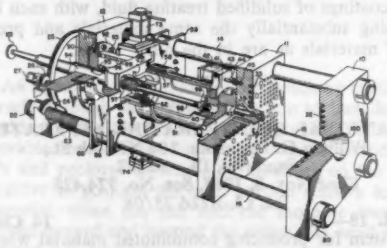
A feed screw for advancing a thermoplastic resin has an interior bore through which a cooling medium is adapted to be circulated by conduits entering from an open entrance end of the bore. Adjustable means inserted into the bore forms a desired bore segment through which the cooling medium is freely circulated, thereby providing a desired temperature gradient along the screw length.

3,588,957

INJECTION MOLDING MACHINE

William H. Schwartz, University Heights, Ohio, assignor to Lester Engineering Company, Cleveland, Ohio

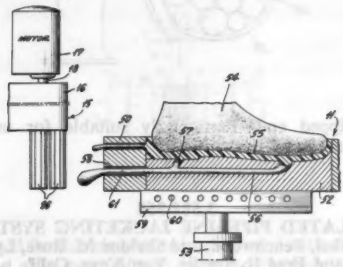
Filed Dec. 5, 1968, Ser. No. 781,552
Int. Cl. A22c *9/00*
U.S. Cl. 18—30LA **11 Claims**



An injection molding machine using a large clamp piston-cylinder assembly connected to the movable platen

through a solid column formed by telescoping cylinders interconnected by shear blocks when the movable platen has been closed to obtain the desired clamping tonnage.

3,588,958
AUTOMATIC SPRUE EXTRACTOR FOR USE IN INJECTION MOLDING MACHINES
Paul E. Metzger, Belcamp, Md., assignor to Bata Shoe Company, Inc., Belcamp, Md.
Filed Dec. 27, 1968, Ser. No. 787,502
Int. Cl. B29c *1/00*
U.S. Cl. 18—30US **7 Claims**



An automatic sprue extractor for an injection molding machine of the type having a molding assemblage and a bottom last provided with an axial channel communicating with the molding cavity by ports and having an aperture leading to the axial channel through which the desired thermoplastic material is injected with such channel, with the ports and aperture having a sprue formed therein upon setting or solidifying of the thermoplastic material, the extractor including a power operated cylinder-piston assembly so related to the injection station that upon activation of the cylinder-piston unit, the piston rod is extended to permit a gripping means associated therewith to grasp the tail of the sprue and upon such gripping action, the piston rod retracts into the cylinder thereby withdrawing the sprue and upon completion of the last mentioned movement, the gripping means releases the sprue for deposit into a suitable receptacle.

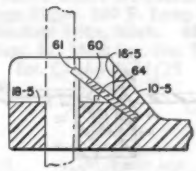
3,588,959
APPARATUS FOR MOLDING PLASTIC LINK CHAIN
Michael T. Russo, Bloomfield Hills, Mich. (1805 Larchwood St., Troy, Mich. 48084)
Filed Feb. 19, 1969, Ser. No. 800,449
Int. Cl. B29c *1/00*
U.S. Cl. 18—42D **1 Claim**

A method and mold for molding a length of interconnected chain links using four V-shaped mold quarter sections arranged to fit together face to face to form a closed mold, each section face formed with a quarter portion of link cavities, to form complete link cavities arranged in two rows in perpendicular planes, within the closed mold. The link cavities are so spaced as to closely space the adjacent ends of pairs of links in one plane to the center of the joining link in the other plane, with a molten plastic feed channel extending into such space and branching out into the two link ends and the link center and connected thereto by narrowed neck portions, so that after the links are molded and cooled in the closed mold, and the mold sections are opened, a physical pull upon one end of the chain breaks the feed neck portions simultaneously freeing the links.

3,588,960
EYEGLASSES RETAINING BAND
Bingham A. McClellan and David J. Hicks, Traverse City, Mich., assignors to McClellan Industries, Inc., Traverse City, Mich.
Filed June 16, 1969, Ser. No. 833,529
Int. Cl. A44b *21/00*; G02c *3/02*
U.S. Cl. 24—3 **5 Claims**

A helical coil of monofilament nylon is set in the form of a flexible and stretchable spring. End turns of the coil are secured to each other in retaining engagement behind an enlargement on the end of a strand of molded polyvinyl. The polyvinyl has an eyelet on its other end and the strand is passed through the eyelet to form a loop and extended through the end turns of the helix to the enlargement.

3,588,961
ADJUSTABLE SELF-LOCKING BUNDLING STRAPS
George Farago, 206 E. 37th St., Brooklyn, N.Y. 11203
Filed Sept. 18, 1969, Ser. No. 859,080
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 **9 Claims**

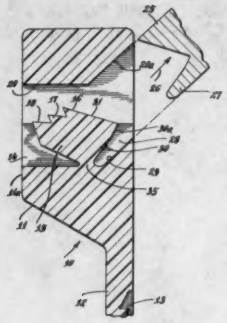


The invention relates to a flexible, self-locking strap of the type having a head at one end of a strap portion with an opening in the head and a metal locking member within the opening, the opening in the head being constructed to provide a seat which accurately positions a locking member adapted to engage firmly the strap portion with predetermined force.

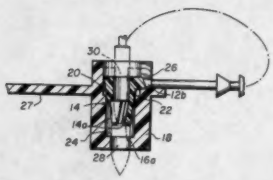
3,588,962
BUNDLING STRAP
Leonard H. Feldberg, Spring Valley, N.Y., assignor to Burndy Corporation
Filed Mar. 12, 1970, Ser. No. 18,885
Int. Cl. B65d *63/00*
U.S. Cl. 24—16PB **6 Claims**

A plastic bundling strap is formed by making an integral plastic casting including a head and a ratcheted strap. The strap is inserted into a locking slot in the head and

is locked by a pawl against release. The pawl is integral with the head and flexes to allow insertion of the strap into the locking slot, after which the pawl locks the strap within the slot against reverse movement. A stop surface for the pawl is formed between the pawl and the head by using an angularly moving core to form a narrow separating slot between the pawl and the head. This separating slot allows flexing of the pawl when the strap is inserted into the locking slot, but limits flexing in a reverse direction through the surfaces thereof acting as a stop. The surfaces are at that angle to the pawl and the strap and the locking slot whereby to accept perpendicularly thereof the forces exerted by the pawl developed by attempted release movement of the strap.



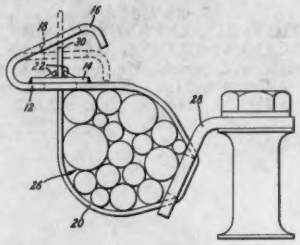
3,588,963
PLASTIC SEAL WITH LOCKING PORTIONS ENCLOSED TO OPPOSE TAMPERING
Sigurd M. Moberg, East Orange, N.J., assignor to E. J. Brooks Company, Newark, N.J.
Filed Mar. 25, 1970, Ser. No. 22,582
Int. Cl. B65d *63/00, 55/06;* G09f *3/16*
U.S. Cl. 24—16PB 8 Claims



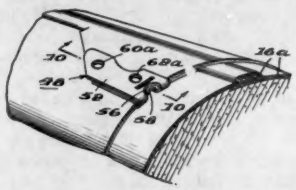
Plastic seals, hitherto having exposed locking portions, are guardingly enclosed within a separate, plastic, guard housing which is secured to the seal by being crimped thereupon. The guard housing is shown as including an integral tag for reception of indicia.

3,588,964
CABLE TIE
Lee V. Dudley, West Chester, Pa., Paul J. Ryan, Willingboro, N.J., and Robert E. Shaffer, Milwaukee, Wis., assignors to General Electric Company
Filed June 9, 1970, Ser. No. 44,780
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 2 Claims

Prior art cable tie having free end adapted to be inserted in slotted end and retained by pawls is modified by providing slotted end with springy perforated U-shaped extension, which collapses during clipping of excess length of free end, and then springs out to form guard over sharp clipped end. Particularly suitable for use with plastic-clad metal ties.



3,588,965
INSULATED PIPELINE JACKETING SYSTEMS
Mike Terkel, Beachwood, and Sheldon M. Rose, Lynhurst, Ohio, and Fred R. Smylie, Van Nuys, Calif., assignors to Ultronix, Inc., New York, N.Y.
Original application Apr. 6, 1966, Ser. No. 540,682, now Patent No. 3,486,534, dated Dec. 30, 1969. Divided and this application June 6, 1969, Ser. No. 844,235
Int. Cl. B65d *63/06;* F16l *9/14*
U.S. Cl. 24—23 3 Claims

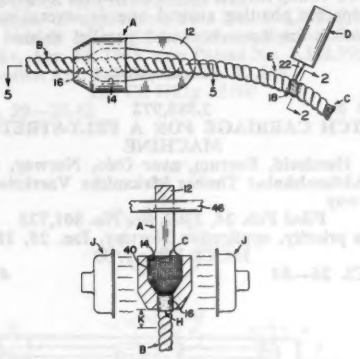


A spring-metal generally U-shaped clip for use in clipping together two ends of a jacket surrounding an insulated pipe, of which one jacket end is formed as a circumferentially extending tab adapted to overlie the other jacket end, said tab being defined by a straightway, axially extending side edge and an inner-end edge inclined by an approximate 45° angle to said axially extending side edge, said clip having a long leg and a short leg, the long leg having length such that it is adapted to underlie both said ends of the jacket and the short leg having length and inner-edge configuration corresponding to said side and inner-edge configuration of the tab, said clip arms being provided with at least one set of aligned holes through which the overlying-underlying portions of the jacket ends circumscribed by said holes may be forced thereby to function as a locking key.

3,588,966
CONNECTOR AND METHOD OF MAKING SAME
Charles S. Thompson, Vincentown, N.J., and William E. Petransky, Lansdowne, and Paul D. Reid, Philadelphia, Pa., assignors to Gulf + Western Industrial Products Company, Grand Rapids, Mich.
Filed Apr. 3, 1969, Ser. No. 812,983
Int. Cl. F16g *11/00;* B23p *25/00*
U.S. Cl. 24—123 14 Claims

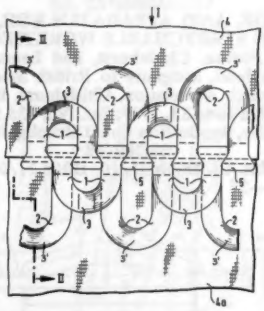
An elongated flexible element, such as a rope, has an enlarged connector lug molded on its end. The lug is molded

by positioning the end of the flexible element in a mold and having the end of the element impregnated with hard-enable material such as thermo-setting epoxy resin. The



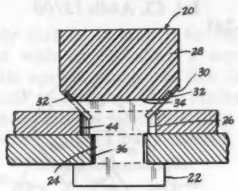
elongated flexible element is impregnated with elastomeric material at its point of exit from the mold so that the lug material cannot leak from the mold.

3,588,967
SLIDE FASTENER
Erhard Speck, Marbach, Germany, assignor to Dr. Karl F. Nagele Feinmaschinenbau, Stuttgart-Hohenheim, Germany
Filed Sept. 25, 1969, Ser. No. 861,133
Claims priority, application Germany, Sept. 25, 1968, P 17 85 446.5
Int. Cl. A44b *19/10, 19/32*
U.S. Cl. 24—205.1 **10 Claims**



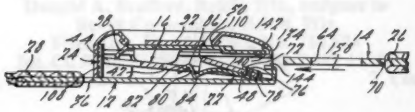
The elements of a slide fastener stringer made from a continuous meander-shaped plastic wire have each a longer leg and a shorter leg, a head connecting the two legs, and intermediate parts connecting each leg to an adjacently juxtaposed element. The legs and head of each element are arranged in a common plane approximately perpendicular to the direction of elongation of the row formed by the elements and to the supporting face of the tape or other carrier on which the elements are mounted. Each longer leg is interposed between a shorter leg and the supporting tape face, and the intermediate parts connecting two outwardly projecting shorter legs are partly depressed into the space between corresponding longer legs so as to touch the carrier face. The stitches which fasten the elements to the carrier pass over at least one of the intermediate parts of each element well below the level of the top faces on the shorter legs, and are thus well protected against abrasion by a slider during normal use of the fastener.

3,588,968
FASTENER DEVICE
George P. Heilman, 290 Phillip Hill Road, New City, N.Y. 10956
Filed Feb. 6, 1969, Ser. No. 797,176
Int. Cl. A44b *17/00;* **F16b** *2/14, 5/06*
U.S. Cl. 24—221L **10 Claims**



A plastic fastener device for fastening two plates together. The fastener is adapted to be inserted through a slot in a base plate and receive a removable plate in locking relation. The fastener has a wing headed handle connected to a shank and an enlarged base portion. Merging with the shank and forming an under portion of the wing headed handle is a cam surface which is adapted upon rotation to bear with a slight degree of resiliency against edges of the slot of the top plate in binding and locking relation. The shank is split such that the fastener can be inserted through a slot in the base plate and retained in place. Through simple rotation of the fastener, the top plate can be unlocked by registration of the slot in the top plate with the wing headed handle for ready removal of the top plate.

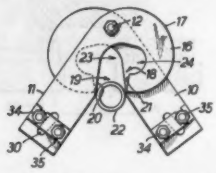
3,588,969
SEAT BELT BUCKLE
Robert Cripps Fisher, 580 E. Long Lake Road, Bloomfield Hills, Mich. 48013
Filed Sept. 11, 1968, Ser. No. 759,066
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 **4 Claims**



A safety belt buckle assembly comprisig a belt tongue having means thereon defining a latching surface; a base member comprising a central web section having a re-entrantly folded latch retainer, and a pair of spaced parallel, upstanding flange sections; a latch member underlying said tongue and engaged in said latch retainer; a belt retainer at the opposite end of said web section from said latch retainer and aligned therewith, the latch member defining a latching face engageable with the latching surface of the tongue; an internal manually operable member; a cover member extending across the upper side of the base member and defining an opening through which the manual operator member is accessible, and

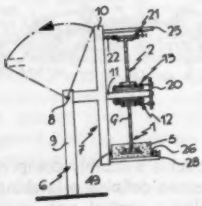
means for biasing the latch member toward a position wherein the latching face thereof is engaged with the latching surface of said tongue and wherein the laterally opposite edges of the tongue are clampingly engaged between the marginal edge portions of the latch member and the flange sections of the base member.

3,588,970
RELEASABLE CLAMPS
Frank B. Harley, Egham, England, assignor to Girdergrip Limited
Filed Feb. 10, 1969, Ser. No. 797,815
Claims priority, application Great Britain, Feb. 15, 1968, 7,522/68
Int. Cl. A44b *13/00*
U.S. Cl. 24—241 5 Claims



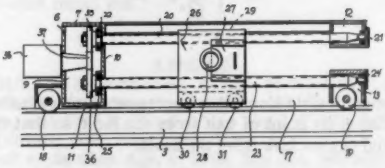
Releasable clamps are described for use in connecting guys or stays to scaffold constructions. The clamps include pairs of plates in pivotal relationship at least one of the plates having a hook in which the scaffold tube can be inserted and thereafter secured by relative pivotal movement of the plates so as to cause the open end of the hook to be bridged. The plates are arranged with the hooks in opposite hand relationship to receive a scaffold tube simultaneously between them.

3,588,971
APPARATUS FOR MANUFACTURING A PAIR OF PREBENT GIRDERS
Abraham Lipski, Uccle, Belgium, assignor to Procedes Nouveaux de Construction, "Preflex" Societe Anonyme, Saint-Gilles, Belgium
Filed Aug. 11, 1969, Ser. No. 848,790
Claims priority, application Belgium, Aug. 19, 1968, 62,395
Int. Cl. B28b *7/08*
U.S. Cl. 25—118T 9 Claims



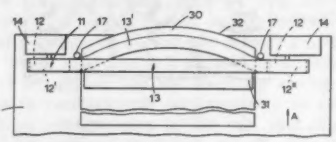
Apparatus for manufacturing a pair of prebent girders by prebending simultaneously the metal trusses of said girders in a vertical plane, maintaining them in the prebent position and embedding the tension flange of the lower truss in a mass of concrete and, the concrete having set, pivoting the pair of trusses around one or several axes, which are horizontal and parallel to said vertical plane, until their respective positions are reversed and then embedding the tension flange of the other truss. A tilting-device is also provided for such a pair of prebent trusses, the lower one of which having its tension flange embedded in a mass of concrete. The device comprises at least two tilting-mechanisms, constituted respectively of truss-supports pivoting around one or several successive axes, which are horizontal and parallel to said vertical plane.

3,588,972
STRETCH CARRIAGE FOR A FELT-STRETCHING MACHINE
Narve Hundseid, Baerum, near Oslo, Norway, assignor to Aktieselskabet Thunes Mekaniske Vaerksted, Oslo, Norway
Filed Feb. 24, 1969, Ser No. 801,733
Claims priority, application Norway, Jan. 25, 1969, 296
Int. Cl. D06c *3/00*
U.S. Cl. 26—54 4 Claims



The invention relates to stretch carriages for felt-stretching machines. Each stretch bearing is mounted in the stretch carriage by means of support means which bear against the running base of the stretch carriage and is further mounted in the stretch carriage by means of two screw spindles extending symmetrically about the axis of the stretch bearing, the screw spindles being rotatably mounted at the ends thereof in the stretch carriage and passing through corresponding nut elements in the stretch bearing.

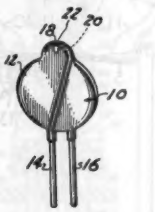
3,588,973
METHOD OF, AND APPARATUS FOR, POSITIONING STRETCHABLE WORKPIECES
Andrew G. Forton, Chislehurst, and Leonard E. York, Oxted, England, assignors to British Scientific Instrument Research Association, Chislehurst, Kent, England
Filed June 23, 1969, Ser. No. 835,570
Claims priority, application Great Britain, June 25, 1968, 30,200/68
Int. Cl. D05b *35/10;* D06c *21/00*
U.S. Cl. 28—77 20 Claims



A method of, and apparatus for, positioning a stretchable sheet workpiece, such as a knitted or woven fabric, for subsequent joining to a further workpiece as by sewing.

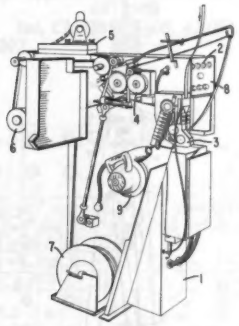
A resilient belt entrained around rollers is placed over the workpiece and the lower run of the belt is distorted in a transverse direction towards an outer edge of the workpiece which edge is to be positioned. The distorted part of the belt is brought into contact with the workpiece near said edge and adheres thereto. Upon allowing the distorted part of the belt to revert to its natural state the workpiece is brought into a position where is outer edge lies along a straight line and this straightened edge can thereafter be brought into joining relationship with an edge of another workpiece.

3,588,974
METHOD OF MANUFACTURING AN ELECTRONIC COMPONENT
Arne Carl Hansen, Arthur Painter Colburn, and Carl William Uebelherr, Milwaukee, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.
Continuation of application Ser. No. 654,292, May 24, 1967, which is a division of application Ser. No. 450,584, Apr. 26, 1965, now Patent No. 3,322,995. This application Apr. 3, 1970, Ser. No. 22,145
Int. Cl. H01g 13/00
U.S. Cl. 29—25.42 6 Claims



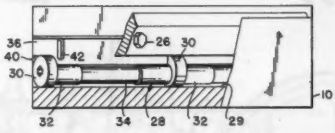
A method of manufacturing an electrical component, e.g. a capacitor, which includes a spark gap, is described. A wire-like conductor is secured to a base material to form a bight portion. The bight portion is severed to form the gap. In one embodiment, the component is encapsulated.

3,588,975
ZIPPER CHAIN MACHINE
Guido Perrella, Montreal, Quebec, Canada, assignor to Dynacast International Limited, Glasgow, Scotland
Original application May 10, 1967, Ser. No. 637,518, now Patent No. 3,482,301, dated Dec. 9, 1969. Divided and this application July 7, 1969, Ser. No. 858,221
Claims priority, application Canada, June 14, 1966, 962,900
Int. Cl. B21d 53/52
U.S. Cl. 29—90.5 3 Claims



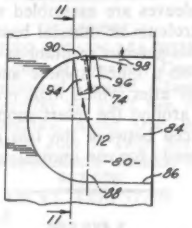
A machine combining in one operation the forming of zipper chain from flat wire stock; the sizing of the zipper elements, and the brushing and polishing of the surfaces of the elements. The forming machine includes an interposing device for allowing the passing of zipper tape through the apparatus without having chain elements secured thereto. The sizing section crimps the working surfaces of the elements so that they are uniform in size and the brushing section sequentially rotates the zipper under contra-rotating brushes so that all the exposed surfaces receive a finishing.

3,588,976
CUTTER WITH ADJUSTABLE CLAMPING BLADES
Hubert Dupuis, Warren, Leslie W. Bowman, Hazel Park, and David A. Hopkins, Detroit, Mich., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.
Filed Sept. 18, 1968, Ser. No. 760,629
Int. Cl. B26d 1/04, 1/12; B23p 15/42
U.S. Cl. 29—95.1 10 Claims



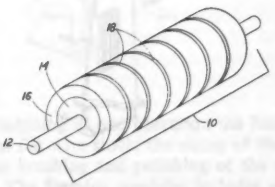
A cutter body such as a broach having an elongated recess provided with or including a separate member having a flat side against which one side of an elongated flat cutting blade is clamped. The blades are adjusted outwardly of the recess by simultaneously operable camming means spaced longitudinally thereof.

3,588,977
INSERT GEOMETRY
Robert A. Bellingham, Southfield, and Victor Milewski, Birmingham, Mich., assignors to The Valeron Corporation
Filed Aug. 6, 1968, Ser. No. 750,616
Int. Cl. B23d 1/12
U.S. Cl. 29—105 6 Claims



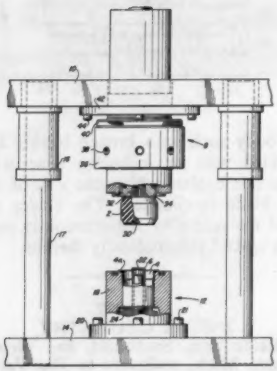
The means and method of using a square cutting insert to bore, mill and turn 90° shoulder walls, while having necessary side clearance, by providing the insert with zero lead, negative radial rake, and positive axial rake.

3,588,978
GROOVED ROLL FOR PAPER-MAKING
Donald A. Brafford, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Dec. 18, 1968, Ser. No. 784,606
Int. Cl. B21b 27/02, 31/08; B60b 7/00, 15/00
U.S. Cl. 29—121 7 Claims



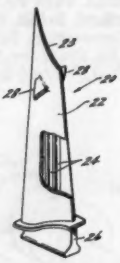
A roll having a plurality of grooves in the exterior surface thereof, said surface consisting of a nonwoven mat wrapping said roll and bonded with a thermosetting resin. Preferred mats for the present invention are acrylic nonwoven mats. The preferred thermosetting resin is an epoxy resin.

3,588,979
BUSHING ASSEMBLY MACHINE AND METHOD
Harvey E. Miller, Logansport, Ind., assignor to The General Tire & Rubber Company
Filed Aug. 28, 1969, Ser. No. 853,902
Int. Cl. B23p *11/00, 11/02, 19/02*
U.S. Cl. 29—149.5NM 21 Claims



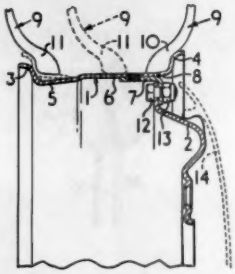
Resilient annular bushings of the type comprising a molded elastomeric insert radially compressed between two concentric sleeves are assembled without the use of conventional petroleum or mineral base lubricants by the use of air or other gaseous medium as the lubricant. The insert is placed on a fluted spindle and is enclosed in a confined chamber after which high pressure air through the spindle and around the insert supplies lubrication as the insert is forced between the two concentric sleeves. The bushing is ready for use immediately after assembly.

3,588,980
METHOD FOR MAKING A CONTOURED ARTICLE
Richard M. Cogan, Cincinnati, Ohio, assignor to General Electric Company
Filed July 17, 1969, Ser. No. 842,666
Int. Cl. B21k *3/04;* B23p *15/02, 15/04*
U.S. Cl. 29—156.8 3 Claims



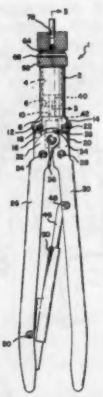
A hollow contoured article, such as a turbomachinery blade or vane, having a hollow internal portion can be made from mill stock by separately forming a pluraity of members from mill stock shape and then forming an unbonded assembly of such members. The members are then separated for removal of selected internal material prior to bonding the assembly of members.

3,588,981
METHOD FOR MOUNTING PNEUMATIC TIRES ON WHEELS
George David Beharrell, Solihull, and George Edward Adams, Kenilworth, England, assignors to Dunlop Rubber Company Limited, Birmingham, England
Filed Nov. 21, 1966, Ser. No. 595,746
Int. Cl. B21b *1/02;* B21k *1/32*
U.S. Cl. 29—159.01 5 Claims



The disclosure relates to vehicle wheels of the tire and rim assembly type comprising a pneumatic tire permanently secured to a metal rim which can be detachably secured to a wheel body.

3,588,982
STAKING TOOL
George William Ziegler, Jr., Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of application Ser. No. 689,649, Dec. 11, 1967, now Patent No. 3,533,051, dated Oct. 6, 1970. This application May 15, 1970, Ser. No. 37,796
Int. Cl. H01r *43/04*
U.S. Cl. 29—203D 8 Claims



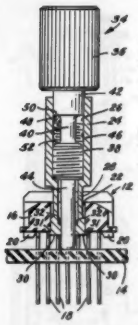
Apparatus for terminating coaxial cable including a hollow body for supporting a coaxial cable, a ferrule and an electrical connector in concentric relationship, with a staking means having a protruding wall engaging the ferrule, and a pair of levers on the apparatus for supporting the protruding wall into engagement with one end of the ferrule to inelastically deform it in engagement against the coaxial cable and connector.

3,588,983

EXTRACTOR TOOL

Ralph C. Hoy, Attleboro, Mass., assignor to Augat Inc., Attleboro, Mass.

Filed Mar. 10, 1969, Ser. No. 805,399
Int. Cl. B25b 27/02
U.S. Cl. 29—203 7 Claims



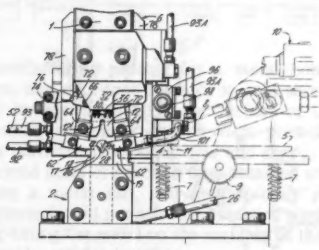
A tool for extracting an electrical contact insulator assembly from engagement with a panel board and including a barrel having spaced legs through which an actuating member projects, the actuating member urging the legs into contact with the insulator assembly and the insulator assembly thereafter being moved with respect to the panel board upon rotation of the actuating shaft.

3,588,984

STRIPPING AND CRIMPING APPARATUS

Lodevicus Lambertus Johannes van de Kerkhof, 's Hertogenbosch, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of application Ser. No. 661,640, Aug. 18, 1967, now Patent No. 3,479,718, dated Nov. 25, 1969. This application Aug. 22, 1969, Ser. No. 852,359
Claims priority, application Netherlands, Aug. 29, 1968, 6812328
Int. Cl. H01r 3/00, 43/04
U.S. Cl. 29—203 12 Claims



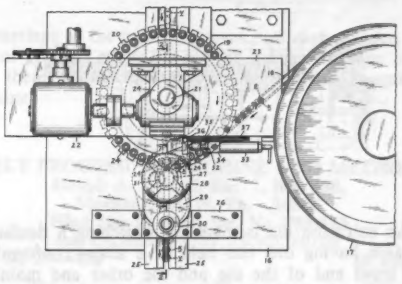
A wire clamp moves ahead of a pair of crimping dies and to clamp a wire end in a notch in a shear plate which is supported by compressed air from a pipe. Stripping blades are then closed about the wire end and withdrawn to strip the wire end. The pipe is then opened to exhaust through a valve so that the shear plate is driven down by the clamp to lay the stripped wire end in a ferrule on a crimping anvil before the dies and can engage the ferrule. Risk of the wire end being nipped between the dies and the ferrule is thus avoided.

3,588,985

APPARATUS FOR UNITING A PLUNGER AND A PISTON OF A FULLY ASSEMBLED HYPODERMIC NEEDLE SYRINGE

Walter A. Shields, Jamaica, N.Y. (38—09 24th St., Long Island City, N.Y. 11101)

Filed Sept. 29, 1969, Ser. No. 861,802
Int. Cl. B23p 19/04; B23g 7/10
U.S. Cl. 29—208 8 Claims



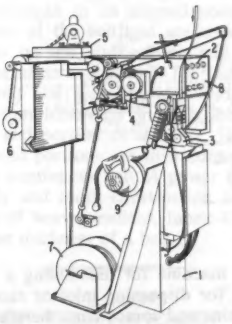
A plunger to actuate the piston of a fully assembled hypodermic needle is united to said piston by moving the syringe longitudinally toward a rotating plunger to engage the piston with said rotating plunger and the rotation of the plunger uniting the piston and the plunger.

3,588,986

ZIPPER CHAIN MACHINE

Guido Perrella, Montreal, Quebec, Canada, assignor to Dynacast International Limited, Glasgow, Scotland

Original application May 10, 1967, Ser. No. 637,518, now Patent No. 3,482,301, dated Dec. 9, 1969. Divided and this application July 7, 1969, Ser. No. 858,223
Claims priority, application Canada, June 14, 1966, 962,900
Int. Cl. A41h 37/06
U.S. Cl. 29—207.5 5 Claims



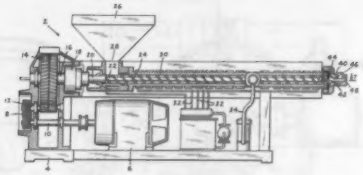
A machine combining in one operation the forming of zipper chain from flat wire stock; the sizing of the zipper elements, and the brushing and polishing of the surfaces of the elements. The forming machine includes an interposing device for allowing the passing of zipper tape through the apparatus without having chain elements secured thereto. The sizing section crimps the working surfaces of the elements so that they are uniform in size and the brushing section sequentially rotates the zipper under contra-rotating brushes so that all the exposed surfaces receive a finishing.

3,588,987

EXTRUSION DIES AND METHOD AND APPARATUS FOR FABRICATION OF EXTRUSION DIES

Edward Korostoff, 6421 Overbrook Ave. 19151, and Gary K. Zin, 304 S. Philips St. 19103, both of Philadelphia, Pa.

Filed Mar. 11, 1970, Ser. No. 18,499
Int. Cl. B23p 17/00
U.S. Cl. 29—400 8 Claims



An extrusion die is made by stretching a flexible diaphragm having one end held in a shape conforming to the input end of the die and the other end maintained in conformity with the desired profile of the part to be extruded.

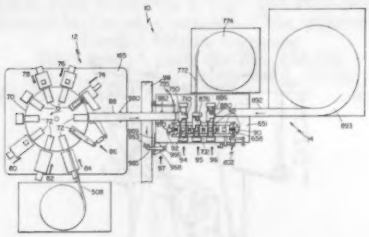
A fluid having hardening properties is applied to one surface of the distended diaphragm. Once the material has hardened, the flexible diaphragm is stripped away, and the resultant contour is coated with a material to form the contour of the die. This contour is cast in a shell, with appropriate heat and heat sensing elements, to form the die.

3,588,988

METHOD AND MACHINE FOR ASSEMBLING A DISPENSER

Richard Joseph Maguire, Scituate, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Oct. 24, 1968, Ser. No. 770,161
Int. Cl. B23p 17/00, 19/02; B23q 7/10
U.S. Cl. 29—400 59 Claims



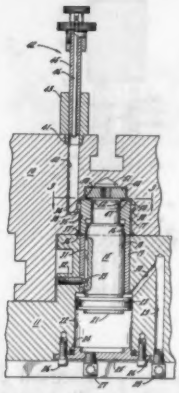
Method and machine for assembling a cartridge-type dispenser (e.g., for dispensing injector razor blades) including a magazine and components therefore, comprising indexing a first nest containing the magazine past a first series of stations for loading a first plurality of components (e.g., blades, spring, and end plug) into the magazine, transferring the magazine to a second nest, and indexing this nest past a second series of stations for loading a second plurality of components (e.g., a blade dispensing member and a used blade compartment) onto the magazine. There are described procedures for indexing the nests at relatively controlled speeds, for protecting blade edges, for manipulating springs, for close assembly of plastic (end plug, used blade compartment) and metallic (magazine) pieces, as well as preferred nest configurations, indexing means, and loading assemblies.

3,588,989

PRECISION LOCATING MEANS FOR MACHINE TOOLS AND METHODS OF CONSTRUCTION

Everett E. Hosea, Butte des Mortes, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed June 26, 1968, Ser. No. 740,133
Int. Cl. B23q 17/18, 3/16; B23k 37/06
U.S. Cl. 29—407 6 Claims



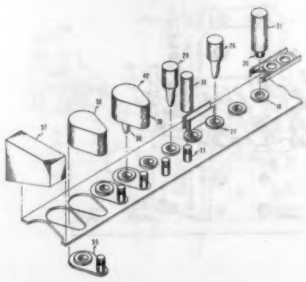
A shot pin receptacle assembly and manufacturing method are described in which a precision bushing is loosely fitted within a receptacle bore, and the elements are assembled in a precise locational relationship with the shot pin being engaged prior to retention of the bushing by injection of a hardenable cementing medium.

3,588,990

MANUFACTURING TECHNIQUE OF SELF-PUNCH AND SELF-CLINCH COMPONENT ASSEMBLY

George F. Klaus and Eric H. Persson, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 16, 1969, Ser. No. 792,233
Int. Cl. B23q 17/00; B23p 19/00
U.S. Cl. 29—407 5 Claims



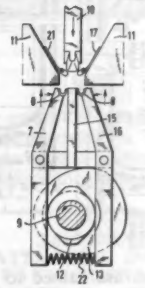
A method of fabricating a part or assembly from sheet material by securing elements to the sheet stock, aligning a parting tool with respect to the secured elements and thereafter blanking or otherwise separating the desired configuration from the balance of the sheet material whereby the profile of the sheet stock base portion of the assembly is not disturbed by a subsequent attachment of any elements.

3,588,991

FORMING AND ATTACHING TOP STOPS TO FASTENER CHAINS

Dieter Maisenbacher, Stuttgart-Steckfeld, Germany, assignor to Dr. Karl F. Nagele Feinmaschinenbau, Stuttgart-Hohenheim, Germany

Filed Sept. 8, 1969, Ser. No. 856,112
Claims priority, application Germany, Sept. 6, 1968, P 17 77 107.2
Int. Cl. B23p *15/00, 19/04*
U.S. Cl. 29—408 4 Claims



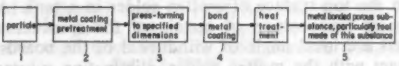
In timed sequence, a pair of top stop blanks are cut from a metal strip, the blanks are bent into U- or V-shape, the bent blanks are supported on a pair of pivotal clamping jaws, and the blanks are attached to the two tapes of a partly assembled fastener chain. The fastener chain is intermittently fed to the jaws with their two tapes disengaged and guided at an acute angle, and the blanks are clamped to the disengaged tapes.

3,588,992

MANUFACTURING PROCESS FOR A METAL BONDED POROUS SUBSTANCE, PARTICULARLY A TOOL MADE OF SAID SUBSTANCE

Toshio Asaeda, Tokyo, Tamaki Tomita, Kariya, and Ikuo Suzuki, Aichi Prefecture, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Aichi Prefecture, Japan

Filed June 12, 1968, Ser. No. 736,485
Claims priority, application Japan, June 16, 1967, 42/38,569
Int. Cl. B22f; B23p *17/00*
U.S. Cl. 29—420 17 Claims



A manufacturing process for a metal bonded porous substance, and of a tool made of it, said substance being obtained by pretreatment of the surface of the particles for a subsequent metal coating step, press-forming the resulting particles to specified size and shape, dipping the press-formed mass of particles thus obtained into a solvent containing a metal salt, and then forcibly passing said solvent through said press-formed mass of particles, thereby precipitating the metal on the surfaces of these particles to bind said particles together.

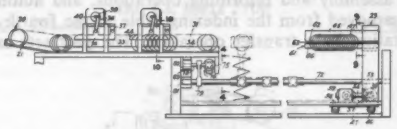
3,588,993

APPARATUS AND METHOD FOR FEEDING NESTED COIL SPRINGS IN ROWS

Dexter L. Turner, Maplewood, N.J., assignor to Kay Manufacturing Corp., Brooklyn, N.Y.

Filed Mar. 21, 1969, Ser. No. 809,166
Int. Cl. B23p *19/00*
U.S. Cl. 29—426 16 Claims

A number of coil springs arranged with their axes horizontal, are removed, while still nested, from a supply of nested springs, by a reciprocating carriage. A pair of swinging fingers on each gripper of an aligned row of grippers, grips and removes only the end spring from



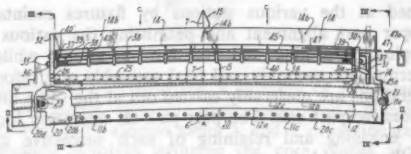
the carriage as the carriage moves past each gripper. The row of grippers erects the row of springs and then transfers them to a conventional spring-row assembling machine.

3,588,994

BELT PROCESSING MACHINE AND METHOD

Joseph A. Parenti, Rte. 7, Box 330, Morgantown, W. Va. 26505

Filed Jan. 6, 1969, Ser. No. 789,193
Int. Cl. B23p *13/04, 19/00, 19/04*
U.S. Cl. 29—430 15 Claims



An end of a belt is inserted in a back end part of the frame of a processing machine and advanced towards its front end part where it is aligned and securely held while power cutting-off the end portion to provide a desired shaped of edge and while drilling spaced-apart hinge bracket mounting holes therealong. The drilled and cut-off end portion of the belt is then released and pulled backwardly towards the back end part of the machine, hinge brackets are positioned to extend over its cut-off edge and in alignment with its drilled holes, and bolt and nut assemblies are then inserted and started to loosely hold the brackets on the belt end portion. Finally, the brackets are flexibly-securely held within the back end part of the machine in an aligned position on the cut-off end portion of the belt and are secured in clamped-over positions on the end portion and over its cut-off edge. The operation is repeated for the other end portion of the belt and it is provided with hinge brackets that have a complementary fit with the hinge brackets on the other end portion of the belt. Hinge brackets of the opposite end portions are then connected by a hinge pin to form a continuous belt. A power saw blade having a special body and tooth construction is used for effectively cutting-off heavy resilient, fabric-like material represented by the thickness of a belt.

3,588,995

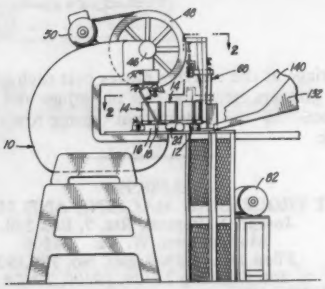
METHODS OF TELESCOPICALLY ASSEMBLING AND INTERFERENCE SECURING PRODUCTION PARTS

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Fredric E. Schmuck, 535 Century Drive, Anaheim, Calif. 92805

Filed Aug. 22, 1969, Ser. No. 852,320
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—430 19 Claims

Sets of production parts to be assembled are progressively moved preferably by use of an indexing table between first and second and third assembly stations and a fourth pick-off station so that the part sets, such as sets of three parts of a ball cock lower unit, may be received at the first assembly station in an initially telescoped

condition, formed into an intermediate telescoped condition at the second assembly station by an intermediate assembly operation, formed into a final telescoped and interengaged condition at the third assembly station by final assembly and reforming operations, and automatically removed from the indexing table at the fourth pick-off station by a transfer operation. The part sets are retained at the various stations by fixtures maintaining proper part alignment and permitting the various telescoping, reforming and transfer operations, while the intermediate assembly and final assembly and reforming operations are preferably carried out at the same time on successive part sets. The part pick-off operation includes the engaging and retaining of each successive of the finally assembled part sets at the fourth pick-off station and the removing or transfer of the part sets one at a time to a location remote from the indexing table.

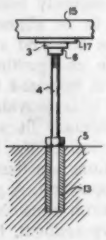


3,588,996

DRILLING AND STUD SETTING APPARATUS AND METHOD

Robert C. McMaster, Charles C. Libby, and Keith Likins, Columbus, Ohio, assignors to the Ohio State University, Columbus, Ohio

Filed Apr. 28, 1969, Ser. No. 819,914
Int. Cl. B23p *11/00*
U.S. Cl. 29—432 **15 Claims**



This disclosure is a method and apparatus for facilitating the driving and anchoring of a tool, bolt, or fastening device in a refractory material or other material with the result that the tool, bolt or fastening device is firmly fastened in the material. Reference is made to the claims for a legal definition of the invention.

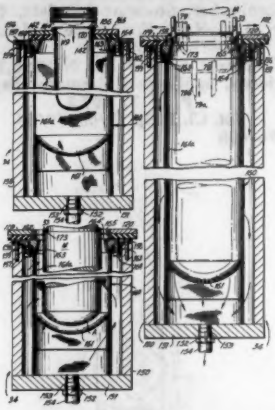
3,588,997

METHOD AND APPARATUS FOR MOUNTING ELASTIC ARTICLES

Donald G. Field, Trenton, N.J., assignor to Youngs Rubber Corporation, Trenton, N.J.

Filed Apr. 4, 1969, Ser. No. 813,465
Int. Cl. B23p *11/02*
U.S. Cl. 29—450 **24 Claims**

This disclosure relates to a method and apparatus for mounting elastic articles, such as condoms, finger cots or the like, on mandrels or similar forms, the interfit between the articles and mandrels being such that, after mounting, the articles are caused to be elastically supported on the mandrels.

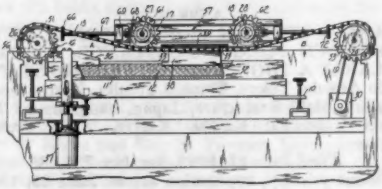


3,588,998

METHOD FOR TREATING ARTICLES WITH A LIQUID

Vincent A. Corsaro, Haverhill, Mass., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed July 16, 1968, Ser. No. 745,253
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 **7 Claims**



A drag line soldering apparatus includes two chains moving over sprocket wheels and mounting a succession of masked circuit boards in article carriers for floatation upon the top surface of molten solder in a tank. Adjustment of the position of certain of the sprocket wheels selects a critical angle of withdrawal of the boards from contact with the molten solder, eliminating substantially all formation of "icicles" of solidified solder. Adjustment of the position of others of the sprocket wheels selects a desired angle of contact and a desired length of contact path between the boards and the top surface of the molten solder.

3,588,999

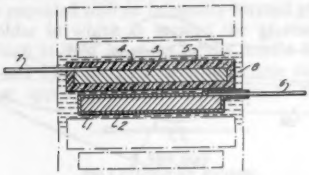
METHOD OF PRODUCING WOUND-FOIL SOLID CAPACITOR

Hajime Sasaki, Yokohama-shi, and Takeshi Namikata and Yuji Ichikawa, Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of abandoned application Ser. No. 548,008, May 5, 1966. This application Jan. 3, 1969, Ser. No. 837,962
Claims priority, application Japan, May 7, 1965, 40/26,642
Int. Cl. H01g *13/00*
U.S. Cl. 29—570 **10 Claims**

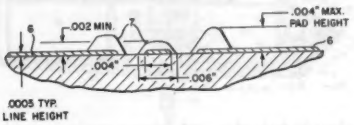
Method of producing wound-foil solid capacitor includes placing a cathode foil and an anode foil formed with an oxide film of the anode material one upon the

other, placing a layer of cellulose derivative separator material between the cathode and anode foils, winding the sandwich of the foils and separator layer into a coil and heating the wound coil to temperatures at which the



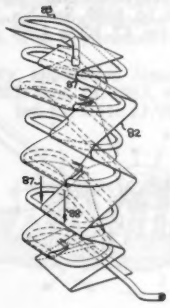
cellulose derivative separator material is vaporized and a manganous salt impregnating the cathode foil is pyrolized and converted to manganese dioxide; and wound coil of solid electrolytic capacitor produced by the method.

3,589,000
METHOD FOR ATTACHING INTEGRATED CIRCUIT CHIPS TO THICK FILM CIRCUITRY
Richard J. Galli, Glen Mills, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 13, 1969, Ser. No. 790,734
Int. Cl. B01j *17/00*; H01l *7/24*
U.S. Cl. 29—590 **5 Claims**



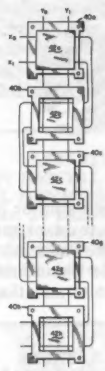
The novel process involves a unique step of mechanically forming metallic coatings to a precise geometry to provide coplanar lands and/or pedestal terminations for bonding to integrated circuit chips. This process utilizes thick film technology which features significant time-saving and cost advantages.

3,589,001
INDUCTION HEATING APPARATUS
Gerard Karol Van Steyn, Columbus, Ohio, assignor to Owens-Illinois, Inc.
Original application Sept. 9, 1966, Ser. No. 578,383, now Patent No. 3,441,706, dated Apr. 29, 1969. Divided and this application Sept. 26, 1968, Ser. No. 788,969
Int. Cl. H01f *7/06*
U.S. Cl. 29—602 **3 Claims**



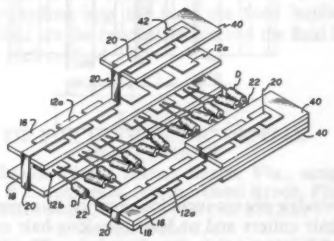
A method for insulating a helical coil wherein plural insulating sheets are interwoven on said coil.

3,589,002
METHOD OF STRINGING APERTURED CORES
John W. Swenson, River Falls, Wis., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Nov. 4, 1968, Ser. No. 772,904
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 **13 Claims**



A method of core-stringing a plurality of two-dimensional core planes, each core plane comprising a plurality of apertured cores aligned along X and Y drive line axes. The method involves stringing the core planes along aligned X drive line axes, stringing the core planes along aligned Y drive line axes, folding the core planes accordian-like into a stacked, superposed three-dimensional core array and then pulling taut the X and Y drive lines.

3,589,003
VOLTAGE AMPLIFIER PROCESS
Ledyard Kastner, 3579 Merrick Road, Seaford, N.Y. 11783
Filed Jan. 19, 1968, Ser. No. 699,100
Int. Cl. H01b *69/02*
U.S. Cl. 29—624R **7 Claims**

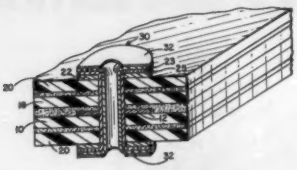


A process of making a voltage amplifier by providing two spaced multicondenser stacks and disposing rectifier elements in said space with the leads bonded in series with various of the condenser plates.

3,589,004
PROCESS OF MAKING REINFORCED FLAT CABLE TERMINATIONS
Joseph M. Shaheen, La Habra, Calif., assignor to North American Rockwell Corporation
Filed Sept. 13, 1968, Ser. No. 759,592
Int. Cl. B41m *3/08*; H05k *3/00*
U.S. Cl. 29—625 **2 Claims**

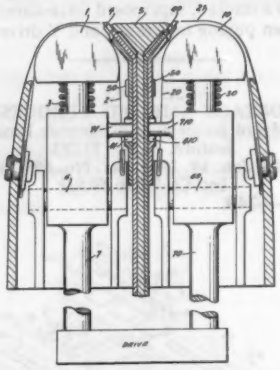
The disclosure is a method of making reinforced circuitry terminations in flexible copper foil circuits wherein reinforcing material, such as epoxy glass, is applied to each side of the flexible circuitry termination and a thin

layer of metal is bonded on the layer of reinforcing material. Holes are then punched or drilled through the layers and the flexible circuitry. The holes are then metal plated by an electroless process or a combination of electroless and electroplating. The holes and select areas around the



holes are then plated with gold or other acid resist material to provide an etch resistant surface. The first metal clad coating is etched off. The reinforcing material is then pattern etched to provide a reinforced circuit termination which is flexible between terminations.

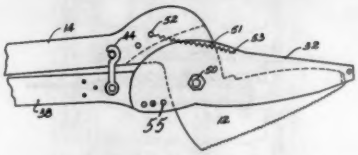
3,589,005
ELECTRIC SHAVER
Richard Fischer, Frankfurt, and Friedrich Schreiber, Bad Homburg, Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Feb. 7, 1969, Ser. No. 797,501
Int. Cl. B26b *19/06, 19/10, 19/38*
U.S. Cl. 30—34.1 **8 Claims**



An electric shaver includes a pair of transversely spaced short-hair cutters and at least one long-hair cutter which is located intermediate the short-hair cutters and can be retracted or advanced depending upon whether or not it is to be used. Drive means is provided for the short-hair cutters and includes a motor and motion-transmitting means associated with the short-hair cutters. The motion-transmitting means is also associated with the long-hair cutter for driving the same.

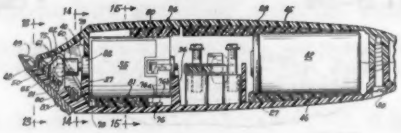
3,589,006
TIN SNIPS
John Lojczyc, 10620 106th St., Suite 1, Edmonton, Alberta, Canada
Filed July 29, 1968, Ser. No. 748,417
Int. Cl. B26b *13/22*
U.S. Cl. 30—144 **10 Claims**

A shear is now provided comprising two cutter units: one unit has two spaced apart cutting blades; the other cutter unit has a single cutting blade positioned between the two cutting blades of the first unit, the units are pivotally connected in a manner similar to that of normal shears or tin snips. To assist in cutting sheet metal tubes having seams, the cutting edges have cutting portions



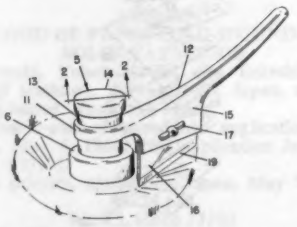
longitudinally spaced therealong of different forms for cutting plain sheet material and for cutting the seams. The single cutting blade is provided with teeth on its back edge for cutting a starting slit in a tube.

3,589,007
ELECTRIC HAIR CLIPPER
William M. Walton, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.
Filed Feb. 24, 1969, Ser. No. 801,410
Int. Cl. B26b *19/02*
U.S. Cl. 30—210 **12 Claims**



An electric hair clipper having a stationary comb blade, a movable shear blade and a rotary motor mounted on and in a housing having a base portion and a lid portion. The motor is optionally energized by a rechargeable battery contained within the housing. The base and lid portions of the housing have a plurality of bosses which variously cooperate to position accurately and retain in assembled relation the motor, the battery, and the stationary comb blade. The movable shear blade is guided accurately in relation to the comb blade, and a highly efficient transmission mechanism is provided between the motor and the movable shear blade. Cutting tension or bias between the two blades is provided by means of a spring of such shape as to permit the forward end of the clipper to have a low profile.

3,589,008
LAWN TRIMMER FOR SPRINKLER HEAD
Alfonso G. Ruiz, 5636 Archcrest Drive, Los Angeles, Calif. 90043
Filed Jan. 14, 1969, Ser. No. 790,996
Int. Cl. B26b *3/00*
U.S. Cl. 30—310 **6 Claims**



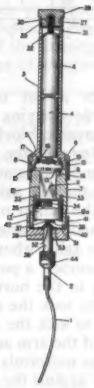
A sprinkler head cup, adapted to be placed on the top of a sprinkler head on a lawn; structure projecting upward from the top of the aforesaid sprinkler head cup,

the structure embodying a screw in the center of the cup, the screw passing through the center of a shaft on which is placed a cylindrical spacer; an enlarged end of a handle; a second cylindrical spacer; and a knob that is secured to the upper end of the screw. The aforesaid handle is provided with an integrally-formed grass-trimmer blade holder in which is located the aforesaid trimmer blade which is held in place in the holder by means of a screw and wing nut. The trimmer blade and its holder may be at approximately thirty degrees to the aforesaid handle.

3,589,009
SPAGHETTI FORK

William J. Miscavich, Canton, and Paul E. Shutt, Strasburg, Ohio; Frances Mary Shutt, executrix of the estate of said Paul E. Shutt, deceased, assignor of a fractional part interest to Frances Mary Shutt, Strasburg, Ohio

Filed Jan. 9, 1969, Ser. No. 790,109
Int. Cl. A47j *41/28*
U.S. Cl. 30—322 **2 Claims**

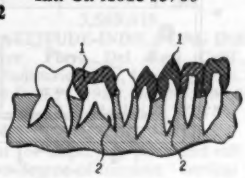


A spaghetti fork having a tine assembly rotatable relative to the handle which is hollow. A battery operated motor is located within the hollow handle and operatively connected to the rotatable tines through a gear reduction. Switch means is provided for electrically connecting the motor to the battery.

3,589,010
METHOD OF MAKING CROWNS, BRIDGE WORKS, POST CROWNS, DENTURES, DENTURE PLATES, AND INLAYS, AND AN EQUIPMENT THEREFOR

Shizuo Taniguchi, Osaka, Japan, assignor of fractional part interest to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 518,635, Jan. 4, 1966. This application June 5, 1968, Ser. No. 734,681
Claims priority, application Japan, Jan. 1, 1965, 40/3,203; Sept. 22, 1965, 40/57,985
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **6 Claims**

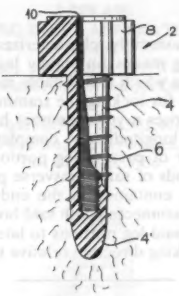


The present invention relates to crowns, bridge works, post crowns, denture plates and various inlay members composed of a polymeric material selected from a chlorotrifluoroethylene homopolymer or copolymer thereof *and* a-vinylidenfluoride homopolymer or copolymer thereof. Examples of copolymers which may be used to produce the former copolymers are those produced from a chlorotrifluorethylene monomer and a vinylidenfluoride or vinylfluoride monomer, and examples of the latter copolymers are those produced from vinylidenfluoride and tetrafluoroethylene or hexafluoropropene. The above denture materials may also contain pigments or reinforcing materials therein. Also the denture materials may be covered with a film of a solution of the aforementioned polymeric materials and pigments to form a coating on the denture plates, etc.

3,589,011
ENDOSSEOUS PIN DENTAL IMPLANT METHOD AND DENTAL DEVICES USED THEREIN

Meer Sneer, 24 Baalei Melacha St., Tel Aviv, Israel

Filed July 10, 1969, Ser. No. 840,711
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 **4 Claims**

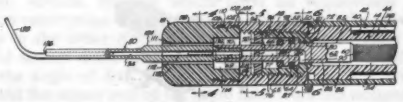


An endosseous pin dental implant method comprises the steps of implanting into the patient's mouth a tissue-tolerant, externally-spiralled, foundation pin formed with an internally threaded bore, and after a length of time sufficient to permit the tissues to form around the foundation pin, threading into the bore the final implant pin. Also described are the foundation pin and the final implant pin used in such method.

3,589,012
TIP FOR ULTRASONIC DENTAL INSTRUMENT

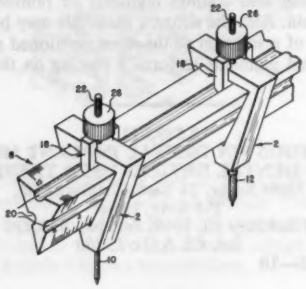
Bruce Richman, North Miami Beach, Fla., assignor to C & B Corporation, North Miami Beach, Fla.

Filed June 30, 1969, Ser. No. 837,581
Int. Cl. A61c *3/10*
U.S. Cl. 32—58 **14 Claims**



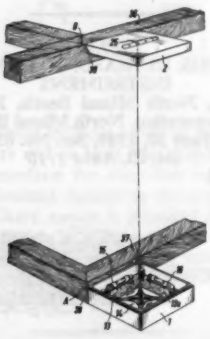
An ultrasonic dental instrument with a chuck for quickly attaching and detaching a work tool which chuck requires the use of no special tools. A conventional magnetostrictive acoustic transformer is included in the dental instrument to vibrate the work tool; the outer end of the acoustic transformer includes a threaded tip portion to engage the threads on the shank of a work tool which is threadably advanced or withdrawn on manipulation of the chuck on rapid assembly and disassembly of work tools from the dental instrument.

3,589,013
BEAM COMPASS
Miquel Angel Rivera Colon, 625 Artico St., Puerto Nuevo, P.R.
Filed Oct. 24, 1969, Ser. No. 868,994
Int. Cl. B43l 9/04
U.S. Cl. 33—27 7 Claims



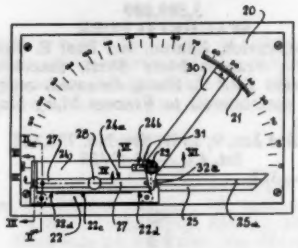
A trammel head assembly, characterized by the provision of improved locking means for rigidly locking the trammel body to a scale upon which it is slidably mounted. More particularly, the means for locking the trammel body to the triangular scale comprises a yoke member having a transverse portion extending longitudinally completely through said opening, and a pair of parallel leg portions that extend integrally from the ends of said transverse portion within corresponding grooves contained in the ends of said trammel body. Screw means connected with said body are arranged to engage the ends of said leg portions to laterally displace said yoke means in a locking direction relative to the scale.

3,589,014
SURVEYING INSTRUMENTS
Stanley Horace Frederick Sarl, 107 Brookside, East Barnet, Hertfordshire, England
Filed Jan. 11, 1967, Ser. No. 608,634
Claims priority, application Great Britain, Jan. 20, 1966, 2,676/66
Int. Cl. G01c 15/12
U.S. Cl. 33—46 4 Claims



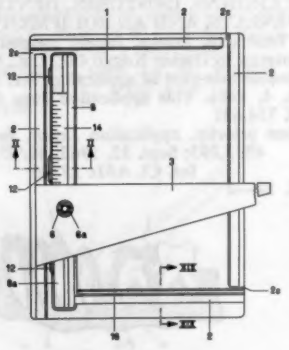
A surveying instrument having two separable elements which can be disposed relative to other structures and manipulated to ascertain and adjust the orientation of such structures. A mirror having a pattern with a plurality of extending arms is mounted on one of the elements and the other element has an aperture through it and a similar pattern, about twice the size of the pattern on the mirror, on its underside. When the elements are exactly aligned, the reflected image of the pattern on the underside of the one element as viewed through the aperture coincides with the viewed pattern on the mirror.

3,589,015
PROTRACTORS
Emile Cellier, Coteau de Boissy Le-Vivie-Du-Lac, Savoie, France
Filed Aug. 25, 1969, Ser. No. 852,612
Claims priority, application France, Sept. 12, 1968, 50,379
Int. Cl. B43l 13/00
U.S. Cl. 33—75 7 Claims



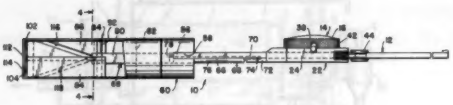
A protractor comprises a flat table provided with a semicircular dial, this table carrying a supporting member adapted to receive a removable block on which is pivotally mounted an arm cooperating with the graduations of the dial. The supporting member and the removable block have centering means to make sure that the axis of rotation of the arm is accurately disposed at the center of the dial. The block is provided with a longitudinally slidable rule which is disposed between the block and the table when the said block is centered by the supporting member, a portion of the upper edge of the rule corresponding to the horizontal diameter of the dial. Means are provided to lock the rule with respect to the removable block and also to lock the arm with respect to the block. The flat rear sides of the arm and of the rule are in the same plane in order to bear uniformly against any planar surface and more particularly against the surface of the table.

3,589,016
DRAWING APPARATUS
Walter Hebel, and Ulrich Hebel, both of Heleneweg 7, 5242 Kircher, Germany
Filed Nov. 20, 1968, Ser. No. 777,363
Claims priority, application Germany, Nov. 20, 1967, H60876
Int. Cl. B43l 13/02, 7/02
U.S. Cl. 33—76 17 Claims



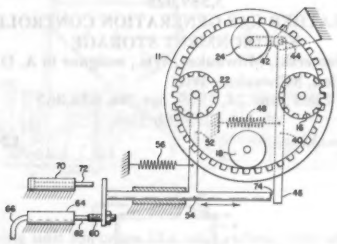
This invention has to do with drawing apparatus and, more particularly, to a drawing board and a straightedge having interengaging parts to permit their operation in drafting.

3,589,017
BORE GAUGE
James Kyle, 21760 Beechwood, East Detroit, Mich.
Filed May 1, 1969, Ser. No. 821,012
Int. Cl. G01b 5/12
U.S. Cl. 33—178 R 7 Claims



The bore gauge is for measurement of the inside diameter of openings in a body. It includes a pair of oppositely disposed blades each having a sensing element at one end for extension into contact with the interior surface of the opening to measure the opening size. A rod structure is operatively connected to the blades by means of a pin and slot arrangement to cause blade movement. Measuring means are provided to measure displacement of the rod, which is related to displacement of the sensing elements, to thereby indicate the inside diameter of an opening.

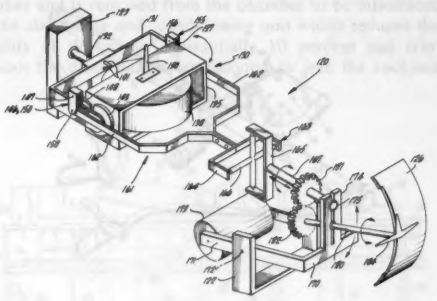
3,589,018
SUPPORT SYSTEM FOR INTERNAL GEAR-CHECKING APPARATUS
Richard T. Thompson, Chicago, and David L. Simpson, Elmwood Park, both of, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Sept. 8, 1969, Ser. No. 855,842
Int. Cl. G01b 5/20
U.S. Cl. 33—179.5 B 5 Claims



Support device for holding and rotating an internal gear while its teeth are being checked, utilizes a pair of master gears and a pair of smooth-surfaced members such as rollers to engage the internal surface of the gear and to rotate it as it is being checked. One of the master gears and one of the rollers are mounted for movement toward the remaining gear and roller to facilitate loading of a gear to be checked.

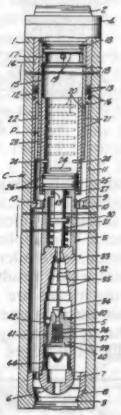
3,589,019
AIRCRAFT ATTITUDE-INDICATING INSTRUMENT
Irven H. Culver, Playa Del Rey, Calif., assignor to Southwestern Industries, Inc., Los Angeles, Calif.
Filed Dec. 11, 1968, Ser. No. 783,005
Int. Cl. G01c 19/32, 19/44
U.S. Cl. 33—204 5 Claims

An instrument for displaying pitch-and-roll attitude of an aircraft. A two-degree-of-freedom vertical gyroscope is suspended within a frame or housing, and is connected to an attitude indicator which moves in the same manner with respect to the frame and aircraft instrument panel as the aircraft moves in pitch and roll with respect to the earth. A novel linkage between the gyroscope and indicator transmits both pitch-and-roll position information over a single path to minimize the number of moving parts in the instrument,



thereby reducing friction and other errors which affect accuracy and reliability of the attitude display.

3,589,020
AIR SIGNALLING DRIFT APPARATUS WITH BLOW TUBE
Wayne M. Sullivan, and John W. Turner, Jr., both of Houston, Tex., assignors to Byron Jackson Inc., Long Beach, Calif.
Continuation-in-part of Ser. No. 581,476, Sept. 23, 1966, abandoned. Filed Aug. 12, 1968, Ser. No. 756,083
Int. Cl. G01c 9/00
U.S. Cl. 33—205 17 Claims

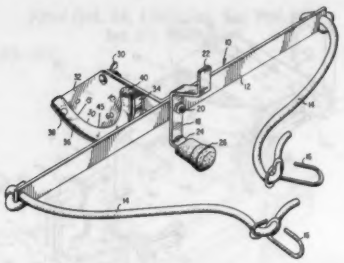


An air signalling drift apparatus in which a knob tube is axially shiftable in one direction in a pulse tube when air well drilling fluid circulation is arrested to uncover a number of ports representative of the angle of drift of the drill stem from vertical, through which ports air sequentially passes upon resumption of circulation and the knob tube moves axially in the other direction, to create pressure pulses in the fluid stream detectable at the top of the well and indicative of the angle of drift, and wherein a blowtube is provided to shield the upper end of the knob tube from the accumulation of foreign matter.

3,589,021
MECHANICAL PELVIC CLINOMETER
Henry W. Hall, Sr., 941 Avon Road, West Palm Beach, Fla. 33401
Filed June 6, 1969, Ser. No. 831,089
Int. Cl. G01c 9/10
U.S. Cl. 33—207 R 3 Claims

A pelvic clinometer comprising a crossbar member with elastic connecting means on opposite ends thereof for fasten-

ing to a person, and leg means projecting from said crossbar member for resting against the sacrum and a clinometer support member projecting rearwardly of said crossbar member and clinometer means secured to said member.

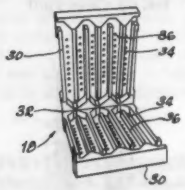


3,589,022

AIR VENTILATING AND CIRCULATING SYSTEM FOR MICROWAVE DRYERS

Henry H. Hering, Jr., Homewood, Ill., assignor to B. Offen & Co. Inc., Chicago, Ill.

Filed Nov. 17, 1969, Ser. No. 877,276
Int. Cl. B01k *5/00*
U.S. Cl. 34—1 5 Claims



A web-drying apparatus comprising a microwave developing means formed of opposed applicators defining a passage for movement of web surfaces in closely spaced relationship to the applicator surfaces. The applicators define ridge portions which serve to concentrate microwaves on web surface areas for generating heat which results in drying action. Air-circulating and supplying means are associated with the applicators for moving air through openings in the ridges and for withdrawing air through openings defined in depressed areas located intermediate the ridges.

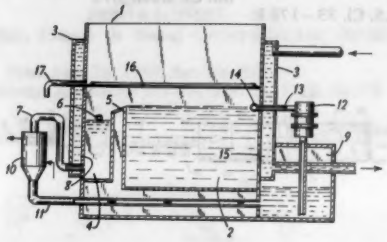
3,589,023

PROCESS AND APPARATUS FOR REMOVING WATER FROM SOLID SURFACES AT LOW TEMPERATURES

Francis John Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed June 10, 1969, Ser. No. 831,890
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 17 Claims

Process for removing water from a nonabsorbent article comprises immersing an article containing a water contaminated surface into a nonboiling solvent liquid bath which solvent is heavier than water and in which water is about 0.1—5 percent by weight soluble, to displace water therefrom, causing the displaced water and solvent to overflow into a separation zone wherein water is removed from the system and solvent is returned to the nonboiling solvent liquid bath, and removing the article from the nonboiling solvent liquid bath. A preferred solvent is an azeotropic mixture of about 97 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane and about 3 weight percent isopropanol. Apparatus comprises a dewatering sump adapted to contain a liquid at a temperature below its boiling point and in a substantially quiescent state, and preferably equipped with cooling means, a water separating sump possessing a smaller surface area than the dewatering sump adapted to receive liquid which overflows from the dewatering sump, means for removing water from the upper portion of the water separating sump and means for transferring liquid from the lower portion of the water separating sump to the dewatering sump.



3,589,024

DRYING OF POROUS PRILLS

Eduard Sulcs, Ljungaverk, Sweden, assignor to KemaNord, Stockholm, Sweden

Filed June 23, 1969, Ser. No. 835,754
Claims priority, application Sweden, June 27, 1968, 8741/68
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 10 Claims

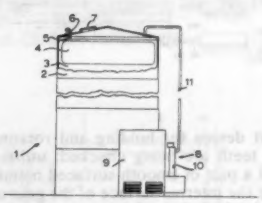
A process for drying porous prills of ammonium nitrate which comprises treating moist prills with an alkyl amine having at least six carbon atoms, and drying the treated prills to a moisture content of less than about 0.4 percent by weight.

3,589,025

ALL WEATHER GAS GENERATION CONTROLLED ENVIRONMENT STORAGE

Frank D. Hamerski, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed June 24, 1969, Ser. No. 836,063
Int. Cl. F26b *3/06*
U.S. Cl. 34—32 12 Claims



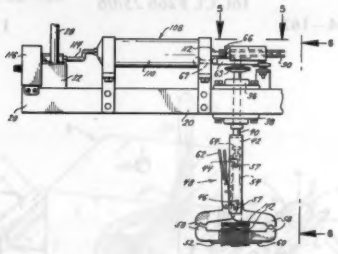
The disclosure is of an all weather gas supply unit for delivering generally inert gas to a sealed storage structure for atmosphere control. In the system, a gas generator combustion chamber exhausts generally oxygen-free gas to a condenser and thence to an icing arrester, the condenser being cooled by ambient air in a cooling shroud system enveloping the condenser and combustion chamber, and the icing arrester serving to collect ice from the gas exhaust when the arrester is in a freezing ambient. The condenser and arrester have water collecting and draining assemblies which are kept from freezing by a heating system such as scavenger air shrouds extending from the cooling shroud. A heating system in the cooling air shroud intake keeps the exhaust in the condenser to temperatures above freezing.

3,589,026

MATERIAL HANDLING DEVICE

Richard H. Hall, Franklin, Tenn., and Thomas P. Duffy, Hazelwood, Mo., assignors to Western Textile Products Company, St Louis, Mo.

Filed Nov. 17, 1969, Ser. No. 877,383
Int. Cl. F26b *13/00*
U.S. Cl. 34—42 19 Claims



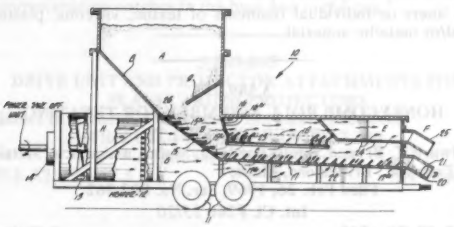
A device oscillates one end of a multiply bundle, which has had the edges thereof treated with a sealant, to cause those edges to "work", and thereby permits that sealant to dry without bonding those edges together.

3,589,027

APPARATUS FOR DRYING

Cleo Duzan, and Max Miller, both of Oakland, Ill., assignors to Royal Industries, Inc., Pasadena, Calif. and Farm Fans, Inc., Indianapolis, Ind.

Filed Nov. 8, 1968, Ser. No. 774,334
Int. Cl. F26b *3/10*
U.S. Cl. 34—57 2 Claims



A drying unit for crops like corn, wheat, rice and the like constructed as a compartment having a drying chamber and a plenum chamber. The drying chamber is constructed inwardly of the outer walls of the compartment with perforated walls to pass the heated air from the plenum chamber. The crops to be dried are received at one end of the drying chamber and carried therethrough by the action of the heated air which functions to fluidize and suspend the crops for conveying them in a wavelike fashion through the drying compartment. The plenum chamber receives the heated air supplied by means of a fan and heater mounted in the compartment adjacent the plenum chamber. The heated air from the plenum chamber also functioning to preheat the crops temporarily stored in the drying chamber to be operated on by the stream of hot air.

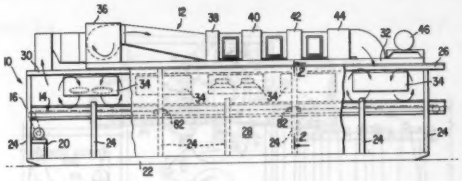
3,589,028

METHOD AND APPARATUS FOR DRYING WAXED FRUIT

William A. Hinton, Atlanta, Ga., assignor to Durand Machinery, Inc., Meriwether, Ga.

Filed Jan. 15, 1969, Ser. No. 791,376
Int. Cl. F26b *17/02*
U.S. Cl. 34—85 2 Claims

A method and apparatus for drying wax fruits wherein the fruit is continuously conveyed through a substantially closed chamber into which warm dry air is introduced at substantially 10 percent relative humidity. The air is circulated across the fruit being conveyed through the enclosed chamber and is removed from the chamber to be introduced into an air-heating and -conditioning unit which reduces the humidity of the air to substantially 10 percent and reintroduces the dried heated conditioned air into the enclosed



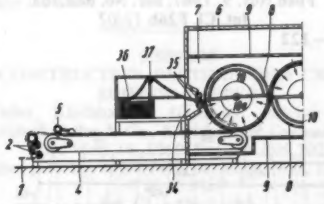
chamber to recirculate over the waxed fruit being conveyed therethrough. A ramp is provided for engagement with rollers on the conveyor such as to rotate the rollers and the articles of fruit conveyed thereon. A pair of counter rotating brushes are angularly disposed to the rollers on the underside of the conveyor such as to remove wax deposited thereon by the fruit being conveyed.

3,589,029

PROCESS AND APPARATUS FOR THE CONTINUOUS TREATMENT OF TEXTILE MATERIALS

Heinz Fleissner, Wolfsgartenstrasse 6, Egelsbach near Frankfurt am Main, Germany

Division of Ser. No. 831,686, Pat. No. 3,521,378. Continuation-in-part of application Ser. No. 654,728, July 20, 1967, now Patent No. 3,503,134, dated Mar. 31, 1970. Filed Nov. 21, 1969, Ser. No. 877,567
Priority, Germany, June 8, 1969, June 22, 1968, June 27, 1968, April 8, 1969, May 9, 1969, P 17 60 604.1, P 17 60 717.9, P 17 60 751.9, P 19 17 757.2, P 19 23 668.1
Int. Cl. F26b *13/30*
U.S. Cl. 34—115 8 Claims

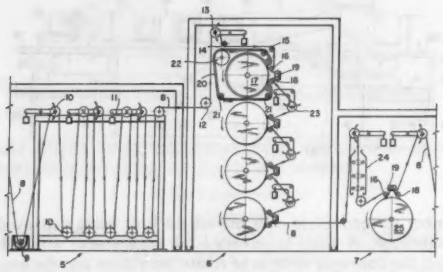


The present disclosure is directed to an apparatus for the treatment of materials which comprises a heat-insulated treatment chamber, a plurality of sieve drum means subjected to a suction draft rotatably disposed within said treatment chamber, fan means associated with the sieve drum means for producing a suction draft and for circulating the treatment medium in said treatment chamber, heating means provided in the circulation zone of the treatment medium, tentering means containing tensioning chains at least partially disposed outside of the treatment chamber as inlet means, said tentering means cooperating with the sieve drum means for the effective conveyance of the material being treated to said sieve drum means, a supporting means disposed below the tensioning chains for supporting the material disposed on said chains and outlet means for removing the material being treated from the treatment chamber.

3,589,030
APPARATUS FOR ADVANCING FABRIC TAPE AROUND A HEATED DRYER DRUM

Walter S. Troope, Latham, and Jackson Lawrence, West Sand Lake, both of, N.Y., assignors to Cluett Peabody & Co., Inc., Troy, N.Y.

Filed Oct. 15, 1969, Ser. No. 866,491
Int. Cl. F26b *13/18*
U.S. Cl. 34—117 15 Claims

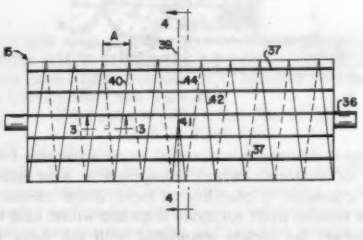


This invention is directed to a system for impregnating with liquid ammonia and drying a continuously advancing narrow fabric tape or ribbon and includes an initial impregnating and aging section, a primary drying section provided with an apparatus comprising a plurality of vertically aligned horizontal dryer drums each of which carries a plurality of wraps of the tape and each of which is provided with a plurality of sets of guide rolls for controlling each wrap of the tape, and a final steaming and drying section provided with at least one horizontal dryer drum that also carries a plurality of wraps of the tape under the control of a corresponding number of sets of guide rolls.

3,589,031
PAPER CONDITIONING APPARATUS

Jack D. Whittaker, St. Annes-on-Sea; Harry W. Loveday, Blackburn; Dennis R. Barbour, Taunton; George S. Dryden, Exeter, and William Tweedie, Exeter, all of, England, assignors to Whiting Corporation

Filed Nov. 9, 1967, Ser. No. 681,751
Int. Cl. F26b *11/02*
U.S. Cl. 34—122 1 Claim

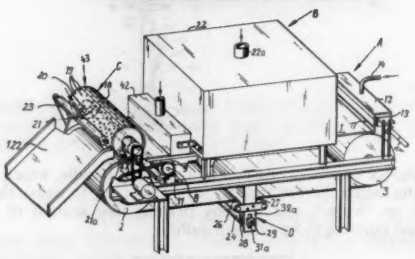


A drum, around which a paper web is passed in the paper conditioning apparatus, has its periphery defined by two wires wound helically outwardly in both directions from the center of the drum, the pitch of each helix being one-half inch. The diameter of each wire is three-sixteenths inch. This pitch and diameter relationship materially improves the efficiency of the conditioning apparatus when handling paper having a weight in the range of 30 grams per square meter to 200 grams per square meter.

3,589,032
APPARATUS FOR MANUFACTURING WEBS OF RECONSTITUTED TOBACCO

Heinz Gretz, Hamburg-Bergedorf, and Wolfgang Zausch, Hamburg, both of, Germany, assignors to Hauni-Werke Korber & Co. Kg., Hamburg-Bergedorf, Germany

Filed Jan. 10, 1969, Ser. No. 790,228
Claims priority, application Germany, Jan. 18, 1968, P 16 57 227.3
Int. Cl. F26b *25/06*
U.S. Cl. 34—162 11 Claims

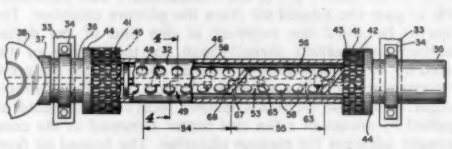


Apparatus for the production of webs of reconstituted tobacco employs an endless flexible belt which transports a moist tobacco-containing layer past a drying station and thereupon to a separating station where the resulting web is separated from the upper stretch of the belt. The latter consists mainly of synthetic plastic material which is reinforced by liners or individual filaments of textile, vitreous, plastic and/or metallic material.

3,589,033
HONEYCOMB ROLL ASSEMBLY FOR TREATING PAPER WITH FELTS

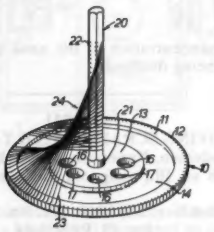
Edward T. Bryand, South Portland, Maine, assignor to Metal-Tech Inc., Briddeford, Maine

Filed Feb. 26, 1969, Ser. No. 802,362
Int. Cl. F26b *25/20*
U.S. Cl. 34—240 5 Claims



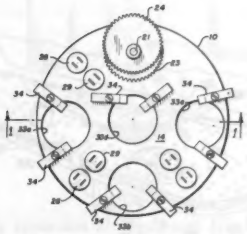
A pocket in the felt web of a paper making machine is ventilated by the use of a hollow, honeycomb pressure or suction roll, in place of the conventional solid roll. The flow of fluid through the felt and through the honeycomb is controlled by turning and axially sliding a multiple pin control rod, each pin selectively axially sliding one of a plurality of perforated, arcuate valve plugs, or deckles, relative to a perforated pressure pipe, which rotatably supports the roll, so that fluid flow is controllable in a plurality of zones axially across the roll and web.

3,589,034
TOY
Ray E. Beecham, Hampton, Evesham, England, assignor to Rantel Pershore Limited, Pershore, Worcestershire, England
Filed Feb. 28, 1969, Ser. No. 803,149
Claims priority, application Great Britain, Feb. 28, 1968, 9557/68
Int. Cl. G09b *1/36*
U.S. Cl. 35—26 8 Claims



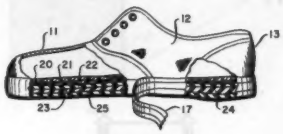
A toy of the occupational creative type comprises a circular base formed in its peripheral edge with a plurality of angularly spaced notches or slots. The base has a central portion provided with a central hole surrounded by a plurality of spaced holes located on a pitch circle of constant diameter. At least one of the holes receives the lower end of an upstanding peg of square cross section provided in each corner with notches or slots of which the total number is equal to the number of notches or slots in the base whereby a pattern can be created by weaving an inextensible thread through corresponding notches in the base and in the peg.

3,589,035
DRIVE UNIT AND PROJECTOR ATTACHMENTS FOR PLANETARIUM PROJECTORS
James D. Vickery, 670 Garland St., Lakewood, Colo.
Filed Oct. 14, 1968, Ser. No. 767,380
Int. Cl. G09b *29/00*
U.S. Cl. 35—42.5 11 Claims



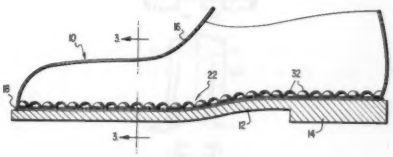
A drive unit and interchangeable projectors form moving or stationary light spots of variable size and intensity simulating astronomical images in planetaria, includes a base frame having a plurality of apertures to receive removable projectors, a geared electric motor including means for transmitting rotary and other motions to the projectors, and electric current connections for the illumination of the systems of the rotary projectors including means for maintaining the current for the projectors during rotation.

3,589,036
FOOTWEAR ASSEMBLY
Willis R. Hendricks, Palos Verdes Peninsula, and Richard L. Danforth, Harbor City, both of, Calif., assignors to Shell Oil Company, New York, N.Y.
Continuation-in-part of application Ser. No. 698,990, Jan. 12, 1968, now abandoned , Continuation-in-part of application Ser. No. 423,724, Jan. 6, 1965, now abandoned. This application Jan. 16, 1970, Ser. No. 880,257
Int. Cl. A43b *13/06*
U.S. Cl. 36—2.5 14 Claims



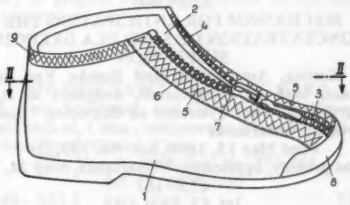
Footwear assemblies are provided in which components comprise certain block copolymers of conjugated dienes with monovinyl arenes or their hydrogenated derivatives.

3,589,037
FOOT CUSHIONING SUPPORT MEMBER
John P. Gallagher, 1519 N. Ocean Way, Palm Beach, Fla.
Filed May 27, 1969, Ser. No. 828,155
Int. Cl. A43b *13/83*
U.S. Cl. 36—44 5 Claims



A foot supporting and cushioning member for footwear in the nature of a removable, preferably disposable, liner constructed from a pair of laminated gas impervious sheets of thin, lightweight, elastic material, and having a multiplicity of separate gas filled pockets distributed over the support surface of the member.

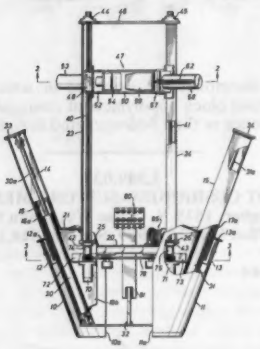
3,589,038
SHOE CONSTRUCTION, PARTICULARLY CHILDREN'S SHOE OR SLIPPER
Josef Sailer, Kirchhausen, Germany, assignor to Esana-Schuhfabrik Sailer & Co., Kirchhausen, Germany
Filed Mar. 10, 1969, Ser. No. 805,707
Claims priority, application Germany, Mar. 12, 1968, P 16 85 282.7
Int. Cl. A43b *23/00*
U.S. Cl. 36—50 14 Claims



To avoid the necessity of a tongue, and prevent catching of stockings beneath slide-fastener closed shoes, the slide-fastener tapes are made of decorative material and seamed to

the top of the respective parts of the upper; in a form of construction, the tapes are of a one-way stretch material permitting lateral stretching and close conformity of the shoe upper to the shape of the foot.

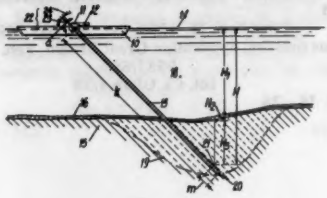
3,589,039
METHOD OF AND APPARATUS FOR TEMPORARILY REMOVING A PORTION OF THE GROUND FROM AROUND A POLE BURIED IN THE GROUND
Albert H. Korenek, 13031 Buxley, Houston, Tex.
Filed Mar. 26, 1969, Ser. No. 810,690
Int. Cl. E02f *5/00*
U.S. Cl. 37—1 **6 Claims**



The apparatus disclosed includes two ground piercing blades mounted for positioning on opposite sides of a pole. The blades are arcuate in cross section and travel into the ground along converging paths. When forced into the ground as far as they will go the blades will combine with the pole to form a conically-shaped container in the shape of an inverted cone with the pole intersecting the apex of the cone. The blades are then raised out of the ground without relative movement between the blades so the blades continue to contain the ground that they have severed and to slide the ground up the pole leaving a cone shaped opening in the ground around the pole. After the exposed portion of the pole is inspected for rot and decay and treated for such, if necessary, the blades are lowered simultaneously back into the conically-shaped hole, sliding the ground contained therein along the pole, after which the blades are moved out of the ground along diverging paths leaving the ground previously severed to fill the hole around the pole.

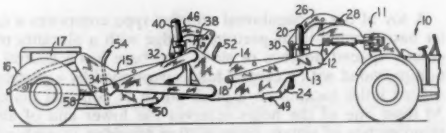
3,589,040
MECHANISM FOR ANTICIPATING THE CONCENTRATION OF SAND IN A DREDGING SUSPENSION
Jan De Koning, Amsterdam, and Romke Van der Veen, Jutphaas, both of, Netherlands, assignors to N. V. Ingenieursbureau voor Systemen en Octrooien "Spanstaal", Rotterdam, Netherlands
Filed May 15, 1968, Ser. No. 729,229
Claims priority, application Netherlands, May 24, 1967, 67.07167
Int. Cl. E02f *3/88*
U.S. Cl. 37—58 **2 Claims**

In underwater dredging, the ambient pressure in the soil or sand being dredged adjacent the tip of the dredging pipe which is buried in the sand is used to control the dredging machinery so that the output of dredged material is increased. A pressure sensitive device is used to anticipate



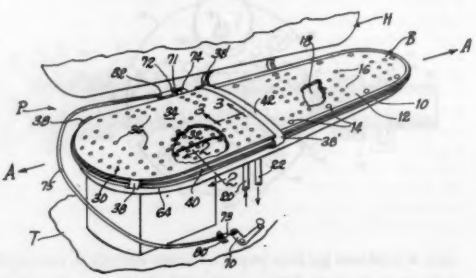
variations in concentration of the sand in the suspension of sand in water being dredged.

3,589,041
EARTHMOVING SCRAPER WITH TANDEM BOWLS
Rodney H. Anderson, Naperville, and John S. Logsdon, Chillicothe, both of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 18, 1968, Ser. No. 776,325
Int. Cl. E02f *3/64*
U.S. Cl. 37—129 **3 Claims**



An earthmoving scraper having two bowls arranged one behind the other and actuating means to cause each bowl, independently of the other, to assume load, carry and discharge attitudes. Power for the scraper includes a forwardly disposed two-wheel tractor with an engine and a pair of rearwardly disposed wheels driven by a second engine.

3,589,042
STEAM AND VACUUM CONTROLLER FOR THE BUCK OF A GARMENT PRESS
Joseph Airdo, Skokie, Ill., assignor to Bishop Freeman Company, Evanston, Ill.
Filed Mar. 11, 1970, Ser. No. 018,414
Int. Cl. D06f *71/34*
U.S. Cl. 38—16 **7 Claims**



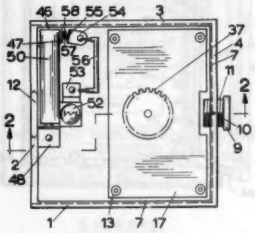
An improved steam and vacuum controller for the buck of a garment press which substantially baffles the apertures in a buck plate at the wide end of the buck plate against the passage of steam from the buck chamber outwardly thereof and against the drawing of vacuum inwardly of the buck chamber at the wide end portion of the buck.

3,589,043

PORTABLE VIEWER FOR MICROFILM

Jeshavahu Klein, 5153 Durocher St., Montreal, Quebec, Canada

Filed Nov. 21, 1968, Ser. No. 777,711
Int. Cl. G09f 11/24
U.S. Cl. 40—95 3 Claims



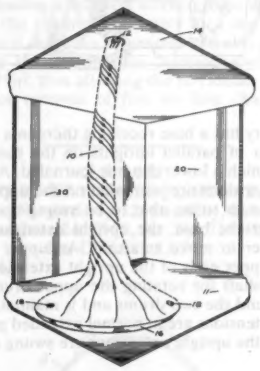
A viewer for microfilm specifically adapted for hand operation, wherein a handwheel is rotated to control and actuate the film wind and unwind operations. A gear is fixed to the end of the handwheel axle for movement therewith and engagement with gears provided on the cassette such as to rotate the spools therein in the desired direction to selectively wind and unwind the microfilm on the spools.

3,589,044

TORNADO DEVICE

William E. Morrison, and Carl T. Laybold, both of Indianapolis, Ind., assignors to Jenn-Air Corporation, Indianapolis, Ind.

Filed Jan. 14, 1969, Ser. No. 790,958
Int. Cl. G09f 13/24
U.S. Cl. 40—106.22 7 Claims



Air moving apparatus arranged and operated as disclosed herein is capable of creating a visible tornadolike phenomenon for display, observation and study.

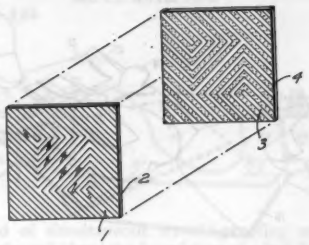
3,589,045

METHOD AND APPARATUS FOR PRODUCING A CHANGING PATTERN

Joseph Rakowsky, Colonia, N.J., assignor to Visual Effects, Inc., New York, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,554
Int. Cl. G09f 13/36
U.S. Cl. 40—106.54 4 Claims

Two like designs are formed, one on a transparent surface, with the two designs spatially separated from each other. When the angle of viewing of one design with respect to the other is changed, either through movement of an observer, or



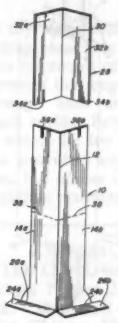
through movement of one or both of the design surfaces, the effect created is one of a constantly changing pattern.

3,589,046

VERTICAL DISPLAY ASSEMBLY

Ethel B. Taub, Highland Park, Ill., assignor to Ronald H. Taub and Charles C. Kirshbaum as Trustees of the Ronald H. Taub Trust, Chicago, Ill.

Filed Apr. 10, 1969, Ser. No. 815,137
Int. Cl. G09f 1/00
U.S. Cl. 40—124.1 3 Claims



A vertical assembly for displaying graphic material, comprising a vertical column having two interconnected panel sections held at a fixed angle with respect to one another, lower marginal horizontal portions of each panel comprising a base for stabilization of said vertical column, and a placard for display of graphic material mounted on the top of said vertical column.

3,589,047

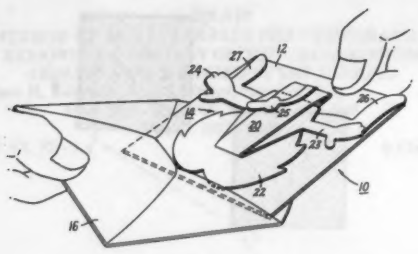
AIR ERECTABLE GREETING CARD

Lowell F. Hess, Southport, and Christopher S. Crowell, New Canaan, both of, Conn., assignors to Chris Crowell & Company, Inc., North Darien, Conn.

Filed Nov. 4, 1969, Ser. No. 873,782
Int. Cl. G09f 1/00
U.S. Cl. 40—124.1 12 Claims

The disclosed novelty greeting card comprises a relatively stiff paper base sheet to which is secured a collapsible, substantially three dimensional caricature, also of paper. The caricature is provided with multiple folds such that it may assume a collapsed state, flat against the base sheet. Blowing

air into the body of the caricature through a hole in the base sheet opens the folds, causing the caricature to assume a substantially erect stance. Evacuation of air returns the caricature to its collapsed state for insertion into an envelope.

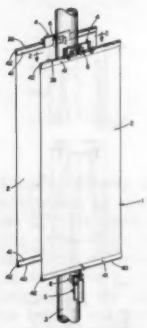


3,589,048

POLE BANNER SIGN CONSTRUCTION

Samuel J. Mollet, Hills and Dales, Canton, and Thomas Friedrichsen, Massillon, both of, Ohio, assignors to The Massillon-Cleveland-Akron Sign Company, Massillon, Ohio

Filed June 16, 1969, Ser. No. 833,262
Int. Cl. G09f *7/22*
U.S. Cl. 40—128 **7 Claims**



The pole banner sign construction has permanent hardware for supporting a flexible banner on a pole. All of the hardware excepting a simple mounting plate at the top and lower ends of the banner is removable from the pole for storage so that it does not present an unsightly appearance when not used for supporting a banner. A simple flexible banner that may be changed from time to time is mounted on the hardware and is adapted to be folded into a small package for shipment in an envelope. A pair of banner members may be similarly mounted on either side of the pole. The banner may be changed from time to time without the use of any tools by merely unhooking several hooks from banner engagement, and transferring pull rods from an initial banner to a replacement banner, and then hooking the replacement banner in place.

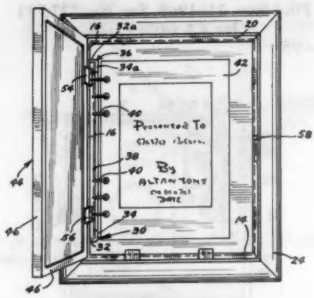
3,589,049

PICTURE FRAME BOX WITH RECORD HOLDER

Thelma L. Cornelius, Glenville, Minn. 56036

Filed July 8, 1969, Ser. No. 839,914
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **3 Claims**

A frame box with record holder including an open front box formation, a looseleaf ring binder having a backbone, means for mounting the ring binder in the box formation and a cover hingedly mounted on said box formation for closing off the front of the box formation and concealing record sheets mounted on said ring binder.

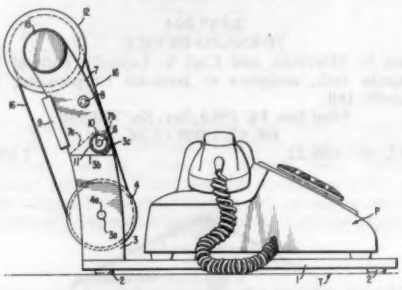


3,589,050

TELEPHONE SET DIRECTORY

Orian S. Niehuss, 705 Gary St., Augusta, Ga.

Filed Apr. 21, 1969, Ser. No. 817,740
Int. Cl. B09f *3/00*
U.S. Cl. 40—336 **8 Claims**



The directory has a base receiving thereon a telephone set, and has a pair of parallel uprights on the base adjacent its rear end, in which a lower drum is journaled. A pair of parallel upright extensions are journaled on the upper ends of the first upright so as to be able to be swung downwardly and forwardly over the base, the upright extensions being connected together to move as a unit. An upper drum is journaled in the upper ends of the upright extensions with knobs on the drum shaft for rotating the upper drum. An endless tape runs around the two drums and is maintained taut when the upright extensions are in normal extended position, and is relaxed when the upright extensions are swung down over the base.

3,589,051

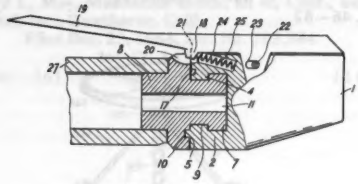
CARTRIDGE CHAMBER AND BREECH UNIT FOR RIFLES

Augustin Necas, Prague, Czechoslovakia, assignor to Brno Zbrojovka, narodni podnik, Brno, Czechoslovakia

Filed Mar. 13, 1969, Ser. No. 807,017
Claims priority, application Czechoslovakia, Mar. 23, 1968, DV2234
Int. Cl. F41c *11/00*; A22b *3/02*
U.S. Cl. 43—32 **7 Claims**

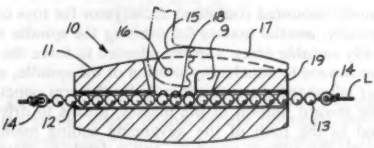
A rifle adapted to be used, for example, in the driving of an anesthetizing instrument into an animal in connection with the slaughtering thereof. The rifle has a cartridge chamber having a flange and groove at its rear end. A breech unit is formed with a front end flange and groove extending, complementing, and interlocking with the groove and flange

of the cartridge chamber to provide a secure connection between the cartridge chamber and breech unit. In its closed position the breech unit closes the bore of the cartridge



chamber and is swingable transversely to the axis of the rifle between a closed position closing the cartridge chamber and an open position opening the latter.

3,589,052
AUTOMATIC SINKER
Harold M. King, Jarrettsville Pike, Phoenix, Md. 21131
Filed Apr. 15, 1969, Ser. No. 816,226
Int. Cl. A01k *95/00*
U.S. Cl. 43—44.88 **15 Claims**

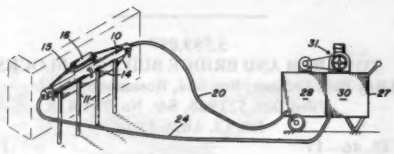


A fishing line sinker comprising a substantially-elongated body member having a longitudinal opening for the passage of a fishing line therethrough. The fishing line includes bead chain means secured at both ends to sections of the line. A transverse aperture is provided through the body wall to the longitudinal opening and has pivotally mounted therein a cam member having a toothed working face adapted to engage beads of the chain to releasably lock the sinker to the line. The sinker is manually releasable and also automatically releasable from the line to slide therealong when reeled-in against the rod tip, thus allowing the remainder of the line to be reeled-in for removal of fish for lure changing, or for storage.

3,589,053
FLOAT FOR NET-FORMED FISHING TACKLE
Hartman Fynbo, Norgardsvey 12, Strandby, Denmark
Filed June 24, 1968, Ser. No. 739,485
Int. Cl. A01k *93/00*
U.S. Cl. 43—44.92 **1 Claim**

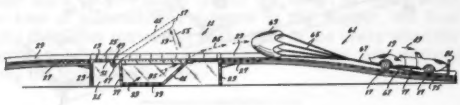
A float consisting of a float member and an attachment member, one of which is provided with an open groove for receiving a rope for fishing tackle to be secured to the float. When the two members are assembled, the groove will form a through passage. One member is provided with external threads releasably engaging corresponding internal threads on the other member thereby securely holding ropes of various thicknesses without the use of tools or other components.

3,589,054
METHOD OF MULTIPLE INJECTION
Michael C. Pascucci, 151 E. Jericho Turnpike, Mineola, N.Y.
Division of Ser. No. 787,514, Dec. 27, 1968. Filed May 15, 1970, Ser. No. 37,682
Int. Cl. A01m *9/00*
U.S. Cl. 43—124 **1 Claim**



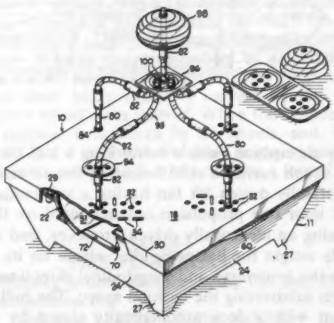
A method of simultaneous termite-proofing and waterproofing of the soil about the foundation of a building.

3,589,055
SIMULATED BRAKING DEVICE FOR TOY VEHICLES
Lester T. Stormon, Manhattan Beach, Calif., assignor to Mattell, Inc., Hawthorne, Calif.
Filed Aug. 12, 1969, Ser. No. 849,387
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 K **8 Claims**



A toy for use with toy vehicles that travel along a track whereby a simulated drag-parachute is pulled from a storage area adjacent the track by means of a simulated shock cord attached to an arrangement that engages and is dragged by a toy vehicle. The storage area may be a compartment disposed below the track surface between the spaced parallel roadway portions on which the toy's wheels run. The compartment may also be provided with a hinged door which conceals the parachute but allows it to be pulled from the compartment with negligible resistance.

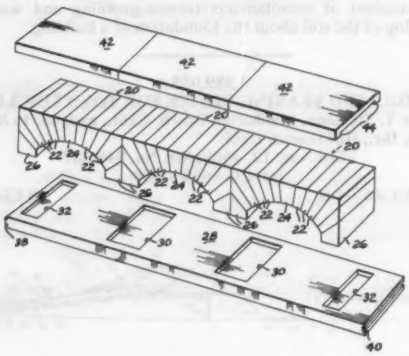
3,589,056
ILLUMINATED CONSTRUCTION TOY
Marvin I. Glass, Chicago; Palmer J. Schoenfield, Evanston, and Joseph M. Burck, Chicago, all of, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Mar. 20, 1969, Ser. No. 808,895
Int. Cl. A63h *33/00*
U.S. Cl. 46—16 **7 Claims**



An illuminated, three-dimensional, design construction toy comprising a housing having a light source and an opaque cover having a number of openings therethrough adapted to

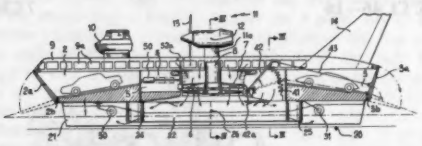
receive the ends of a plurality of plastic rods which are capable of transmitting light along their lengths. Coupling elements are provided for joining two or more rods so that the design may extend in an upwardly direction. Each of the coupled rods receive light from the base. A multicolored, rotatable, light-transmitting wheel may be provided intermediate the light source and the rods to produce a variegated illumination of the design.

3,589,057
TOY ARCH AND BRIDGE BUILDING BLOCKS
Carl Roy Paul Fechner, Box 664, Rosamond, Calif.
Filed Dec. 5, 1968, Ser. No. 781,428
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 **1 Claim**



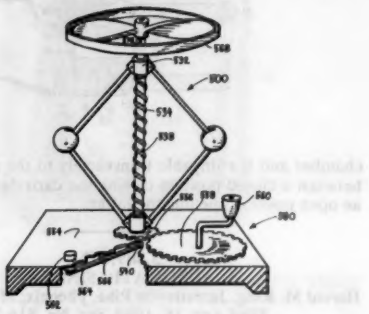
A plurality of preformed blocks forming a series of voussoir members are cooperatively assembled with an impost base and overlying roadway members to form toy bridges and the like.

3,589,058
TOY GROUND EFFECT VEHICLE WITH ADJUSTABLE STABILIZING WEIGHT
Ivan Pierre Andrew Labat, Paris, France, assignor to Societe d'Etudes Et De Developpement Des Aeroglisseurs Marins Ferrestres Et Amphibies, Sedam, Paris, France
Filed Dec. 18, 1969, Ser. No. 886,336
Claims priority, application France, Dec. 24, 1968, 180460
Int. Cl. A63h *17/00, 29/16, 33/26*
U.S. Cl. 46—44 **13 Claims**



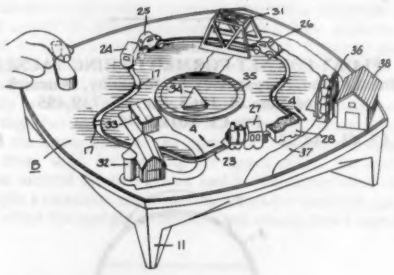
A toy air cushion vehicle comprising a hull the lower portion of which carries a skirt bounding the air cushion space, an electrically driven lift fan having a substantially vertical axis, at least one propulsion unit mounted on the hull and comprising an electrically driven propeller, and at least one movable weight for balancing the vehicle on its air cushion both in the transverse and longitudinal directions. The skirt has parts subdividing the cushion space. The hull has a compartment with a door automatically closed by the lift fan through a pneumatic device. The propeller may be a flexible member maintaining its shape partly by centrifugal force and may have a torque limiter including a magnetic or friction coupling.

3,589,059
ROTARY ACCELERATOR FOR TOYS
Craig Vaughn Caswell, 740 Evergreen Road, Severn, Md.
Filed Dec. 8, 1969, Ser. No. 883,075
Int. Cl. A63h *27/00*
U.S. Cl. 46—82 **2 Claims**



A spindle mounted rotational accelerator for toys comprising typically, inertial masses for orbiting the spindle on symmetrically variable arms, a spring adapted to force the masses to move inward to accelerate rotation of the spindle, a sliding member advanced along the spindle by the arm concurrently with the inward motion of the masses, means to drive a toy disposed in the path of the advancing sliding member for release by the sliding member, and a latch to restrain the spring from forcing the masses inward.

3,589,060
SCENIC ROAD TRAVEL TOY
Robert Genin, Scarsdale, N.Y., assignor to Child Guidance Toys Inc., Bronx, N.Y.
Filed May 21, 1969, Ser. No. 826,338
Int. Cl. A63h *11/00*
U.S. Cl. 46—122 **5 Claims**



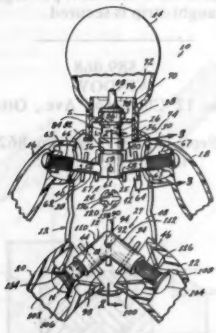
A scenic road travel toy in which vehicles such as automobiles and trains move along an undulating road about whose sides are disposed barns, houses and other structures normally encountered in the course of travel. The toy is constituted by a hand-operated turntable having radial slots formed therein. Overlying the turntable is a board providing the scenic terrain, the board having a continuous channel cut therethrough which undulates in a path intercepting all of the radial slots in the turntable to define an endless road. Also provided are vehicles having follower pins projecting therefrom which are receivable in said slots, such that as the turntable rotates, each pinned vehicle is caused to travel along the undulating road.

3,589,061

DOLL WITH FLEXIBLY-JOINED APPENDAGES

David L. Bear, Palos Verdes Estates; Gregory M. Guenther, Palos Verdes Estates; Donald Markey, Jr., Hawthorne, and Richard L. May, Manhattan Beach, all of, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 23, 1968, Ser. No. 785,884
Int. Cl. A63h *3/20*
U.S. Cl. 46—161 12 Claims



Joint assemblies for joining the head, arms, and legs of a doll to the trunk, which enable lifelike bouncing movement of these appendages, comprising rubber armatures fixed in the truck and having elongated portions extending to the appendages. The elongated portions extending to the head and legs have outer sections of reduced diameter to cause pivoting to occur about a pivot point near the appendage, as occurs in a human body.

3,589,062

AMUSEMENT DEVICE SIMULATING A GUITAR CONTAINING A CONCEALED WEAPON

Johnny Desmond, Great Neck, N.Y., and Thomas S. LoDuca, West Allis, Wis.

Division of Ser. No. 662,378, Aug. 22, 1967, Pat. No. 3,524,377.
Filed Sept. 30, 1969, Ser. No. 862,273
Int. Cl. A63h *5/00*
U.S. Cl. 46—175 5 Claims

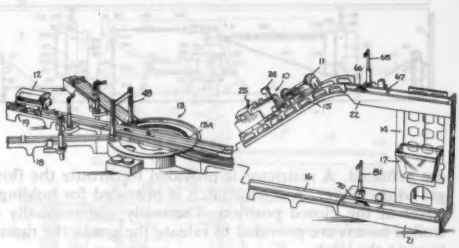
An amusement device in the form of a play guitar having a toy gun concealed behind a hinged door in a compartment located in the sound box portion of the instrument in combination with a quick-release mechanical linkage, actuated by a pushbutton located on the neck of the instrument, for springing the door and thrusting the toy weapon outward into a position where it may be readily drawn for use.

3,589,063

MOTORIZED SHUTTLE TRAIN

Robert Genin, Scarsdale, N.Y., assignor to Child Guidance Toys Inc., New York, N.Y.

Filed Sept. 12, 1969, Ser. No. 857,414
Int. Cl. A63h *19/00*
U.S. Cl. 46—216 10 Claims



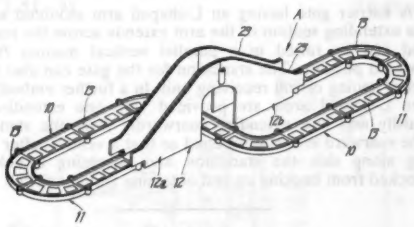
A toy railroad assembly wherein the track layout includes a turntable adapted to link any one of a group of sidings to a steep track section leading to the top of an elevator tower or to a level track section leading to the base of the tower, a hopper being shiftable up or down the tower. A motorized shuttle train may be coupled to a loaded dump car resting in one of the sidings and thereafter caused to climb the steep-grade track section to the top of the tower, at which point the load is automatically dumped in the hopper, the load being thereafter retrievable at the base of the tower when the shuttle train and dump car coupled thereto goes thereto along the level track section.

3,589,064

TOY TRACK SYSTEM

Takayuki Harada, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1969, Ser. No. 803,602
Claims priority, application Japan, Apr. 2, 1968, 43/26,155
Int. Cl. A63h *18/04*
U.S. Cl. 46—243 8 Claims



A toy track system which comprises a wheeled and powered toy vehicle and a closed track on which the vehicle is adapted to travel. The track has a bridge incorporated therein which includes racks engageable by gears which are provided on a shaft operatively connected to a motor of the vehicle, said shaft being rotatably carried by the vehicle, separately from wheel axles thereof. When the vehicle travels on a level surface, it is driven by its wheels, and, when it crosses the bridge, it runs with the gears engaging said racks. The vehicle runs on the track while moving a funnel up and down.

3,589,065

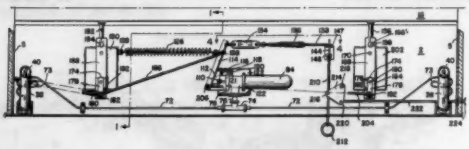
FIRE VENT HATCH

Robert C. Watson, Bohem Manufacturing Co. Inc., P.O. Box 321, Conshohocken, Pa.

Filed Dec. 9, 1969, Ser. No. 883,553
Int. Cl. E05f *15/20*
U.S. Cl. 49—7 19 Claims

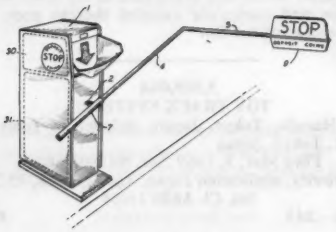
A fire vent hatch has a housing with upstanding sidewalls and a cover pivotally secured to one of the sidewalls. A pair

of rams are mounted on the housing to raise the cover, the rams being connected to a sealed container containing gas under pressure. The lower end of the rams are each pivotally connected to an arm which in turn is pivotally connected to the housing, the arms swinging downwardly when the rams



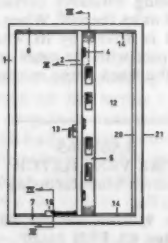
are actuated. A restrictor is provided to throttle the flow of gas to the cover. A scissor latch is provided for holding the cover in the closed position. Thermally and manually controlled means are provided to release the gas to the rams and to open the latch.

3,589,066
BARRIER GATE
Warren H. Fisher, Hasbrouck Heights, N.J., assignor to Faller & Cooper, Inc., Brooklyn, N.Y.
Filed May 26, 1969, Ser. No. 827,786
Int. Cl. E05b *65/00*
U.S. Cl. 49—35 **15 Claims**



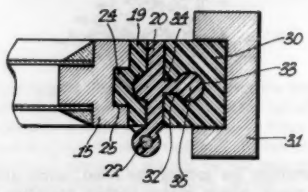
A barrier gate having an L-shaped arm mounted so that the extending section of the arm extends across the roadway and can be raised in a parallel vertical manner from a lowered position. The stanchion for the gate can also hold a ticket issuing or toll receiving unit. In a further embodiment, two L-shaped arms are provided with one extending forwardly and one extending rearwardly from the stanchion. The rearward arm is positioned so that a vehicle, after entering along side the stanchion and accepting a ticket, is blocked from backing up and obtaining another ticket.

3,589,067
SASH-CONSTRUCTION
Jordaan Knaap, Oosterbroek 4, Eelde, Netherlands
Filed Mar. 10, 1969, Ser. No. 805,652
Int. Cl. E05d *15/22*
U.S. Cl. 49—177 **10 Claims**



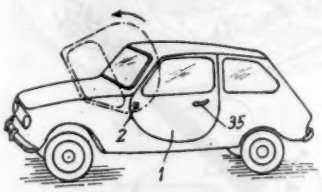
A sash-construction having a notch against which a swing window or similar closing element, particularly a window swinging outwardly, is capable of being stopped, said window with its hinges is fixed to a separate narrow panel which is slidable in the plane of the normally closed sash and with the panel ends being guided with respect to the mutually parallel sash-sills. The ends of the narrow panel carrying the window hinges are in cooperative relation with a profile fillet applied to sills or posts. The slidable narrow panel carrying the window hinges is formed near its ends with a slipper or similar slide element, capable of slidably cooperating with the profile fillet present on the sill or post in question, while the edge of the panel carrying the window hinges abuts a case-shaped end of a profile fillet fixed to a sash-portion in which case a resilient elastic draught-strip is secured.

3,589,068
WINDOW
Jack H. Leedham, 12 Clarendon Ave., Ottawa 3, Ontario, Canada
Filed Sept. 30, 1969, Ser. No. 862,269
Int. Cl. E05d *15/22*
U.S. Cl. 49—162 **1 Claim**



The invention relates to a window assembly comprising upper and lower units, the lower unit consisting of two glazed parts situated side by side in a common plane. Each of the two glazed parts is hingedly mounted for horizontal swinging movement. The lower unit is moreover vertically slidable as a unit.

3,589,069
VEHICLE DOOR MOUNTING
Alexandre Lecomte, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, Hauts de Seine, France and Automobiles Peugeot, Paris, France
Filed Mar. 10, 1970, Ser. No. 18,180
Claims priority, application France, Mar. 10, 1969, 6,906,746
Int. Cl. E05d *15/58*
U.S. Cl. 49—257 **6 Claims**



This mounting for a door of vehicle adapted to open by pivoting to an upper position about a fixed pivot shaft extending transversely to the main plane of the door is characterized in that the door engaging a frame structure of the vehicle body in the closed position is operatively connected to a ring member slidably fitted on, and rotatably rigid with, a socket rotatably mounted on, but axially fixed in relation to, said pivot shaft receiving said door in overhanging relationship, said door carrying in the vicinity of the fastening of said shaft a plate adapted to support control members pivoted between said plate, said door and said ring member, whereby the actuation of said control member will cause a movement of translation of said ring member on said socket

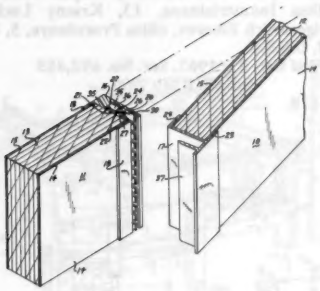
to free the door from its frame structure or reinserting the door into said frame structure before or after its pivotal movement.

3,589,070

RADIATION-RESISTANT JOINT BETWEEN DOOR AND FRAME

Carl Arthur Hansen, Bethel, Conn., assignor to Ray Proof Corporation, Norwalk, Conn.

Filed Apr. 3, 1970, Ser. No. 25,504
Int. Cl. E06b 7/22
U.S. Cl. 49—483 4 Claims



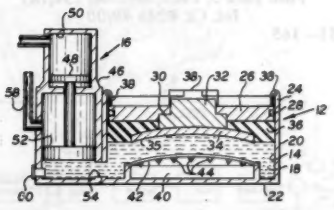
A device for use with a radiation-resistant enclosure in forming a radiation-resistant joint between the edges of a door for the enclosure and the door frame, the device including cooperating parts on the edges of the door and frame respectively, one of the parts having a lateral slot at right angles to the door when it is closed and with parallel walls extending lengthwise of said edges and with spaced inwardly engaged bowed resilient metallic fingers on the walls of said slot. The other of said parts has a member which enters between the bowed fingers for establishing both mechanical and electrical connection between the parts when the door is closed. The fingers are specially shaped and specially mounted so that they cannot be accidentally removed but at the same time greatly facilitate assembly and repair in case of breakage.

3,589,071

SURFACE POLISHING APPARATUS AND METHOD THEREFOR

Hans S. Hirschhorn, 30 Brook Path, Plainview, N.Y.

Filed May 21, 1969, Ser. No. 826,382
Int. Cl. B24b 19/00
U.S. Cl. 51—7 6 Claims



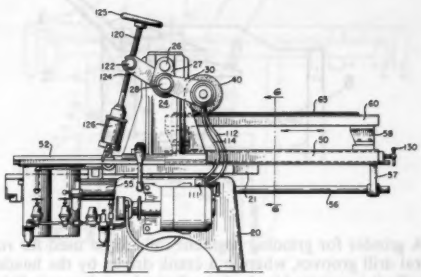
An apparatus and method utilizing a polishing slurry for fine polishing of articles as lenses or the like, in the operation of which the slurry, with its abrasive or polishing particles suspended therein, is initially confined under pressure against the article surface to be polished and then subjected to vibratory movement which causes polishing movement of the slurry polishing particles over this article surface and thus uniform polishing thereof.

3,589,072

FINISHING MACHINE

William C. Burt, Olean, N.Y., assignor to Clair Manufacturing Co., Inc., Olean, N.Y.

Filed Apr. 29, 1969, Ser. No. 820,242
Int. Cl. B24b 7/00
U.S. Cl. 51—45 3 Claims



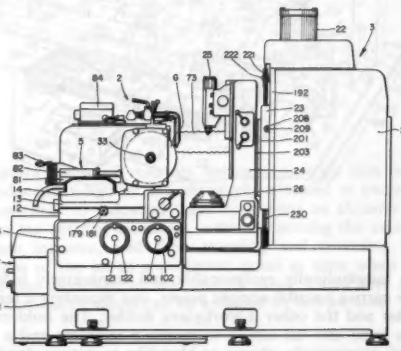
This invention relates to surface finishing machines, and more particularly to improvements in such machines of the type that are especially adapted to rough, brush polish, glaze, buff, satin finish, mirror finish, or otherwise finish sheet, plate, strip, coil, or any other type workpieces such as name plates, decorative hardware, engravure stock, printed circuit panels, or the like.

3,589,073

GRINDING DEVICE

Isamu Okamoto, and Mutsuo Hosoi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Okamoto Kohsakukikai Seisakusho, Yokohama City, Kanagawa Prefecture, Japan

Filed Jan. 27, 1969, Ser. No. 794,226
Claims priority, application Japan, Aug. 17, 1968, 43/58688
Int. Cl. B24b 3/34
U.S. Cl. 51—95 10 Claims

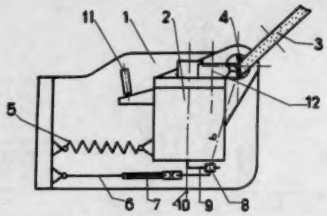


A gear grinder having a prime mover to drive both a grindstone and a work to be ground in synchronism with each other. The gear grinder has a power transmission means to deliver output from the prime mover to both the work and the grindstone for moving them, which transmission means includes a uniform universal joint having a spur gear slidably engaging a pinion located on power receiving side. The spur gear slides along said pinion as one of the work and the grindstone moves relative to the other.

3,589,074
GRINDER FOR SEGMENT ROLLS

Marian Michalczyk, Katowice, Poland, assignor to Huta Baildon, Katowice, Zelazna, Poland

Filed Nov. 14, 1968, Ser. No. 775,704
Int. Cl. B24b *7/00, 9/00, 47/02*
U.S. Cl. 51—96 **3 Claims**

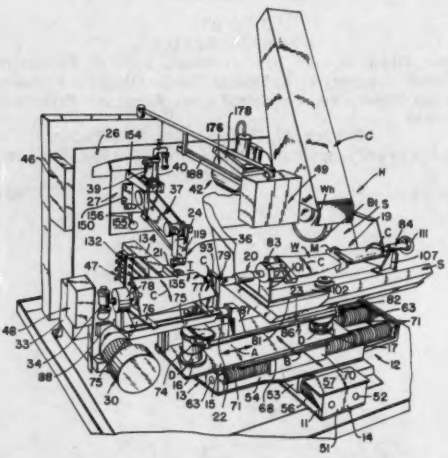


A grinder for grinding segment rolls to be used for rolling spiral drill grooves, wherein a crank driven by the headstock spindle is connected to the base through a telescopic link, the headstock being spring urged toward a stop and carried on a rotatable bracket.

3,589,075
AUTOMATIC CYCLE CONTOUR FINISHING MACHINE

George R. Carlson, 830 Cranbook, Birmingham, Mich.

Filed Nov. 29, 1968, Ser. No. 779,860
Int. Cl. B24b *17/00, 7/00, 9/00*
U.S. Cl. 51—101 **26 Claims**

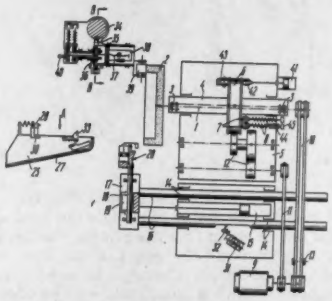


A longitudinally reciprocable and transversely indexable base carries parallel upright pivots, one mounting a template holder and the other a workpiece holder. The holders each have head and tail stocks to mount a template and a workpiece, respectively, shown as bladelike in nature, for pivotal movement in substantially coaxial alignment. A rotary finishing head engages the workpiece from above and a tracer engages the template from above as the latter is sustained from beneath by a reaction ball camming device. The base is reciprocated by hydraulic cylinder means, and is hydraulically indexed transversely after reciprocatory cycles. The tracer follows the contour of the template, and universal joint and connecting rod linkage means, plus the ball device, operatively articulate the template with the workpiece in such manner that the latter is gradually swung about horizontal and jogged about vertical axes as it travels horizontally beneath the finishing head to finish a compoundly curved turbine or like blade surface. The template tracer maintains the surface of the finishing head in flush, line contact with the workpiece by coaction with limit switch and hydraulic control means.

3,589,076
MACHINE FOR SHARPENING CUTTING TOOLS

Viktor Andreevich Gorshkov, Leninsky prospekt, 11, kv. 48, Moscow; Vasily Dmitrievich Morozov, Leninsky prospekt, 88, korpusl, kv. 96, Moscow; Valentin Alexeevich Romanov, Leninsky Prospekt, 95, kv. 153, Moscow; Lev Samollovich Slonim, Chernomorskay bulvar, 7, korpus 4, kv. 242, Moscow; Vitaly Arkadievich Shliomovich, ulitsa Kominterna, 40, kv. 49, Moscow; Stepan Anisimovich Goshin, ulitsa Industrialnaua, 13, Krasny Luch, and Nokolai Grigorievich Ziborov, ulitsa Proezdnaya, 5, Krasny Luch, all of, U.S.S.R.

Filed Dec. 21, 1967, Ser. No. 692,453
Int. Cl. B24b *7/00*
U.S. Cl. 51—119 **2 Claims**

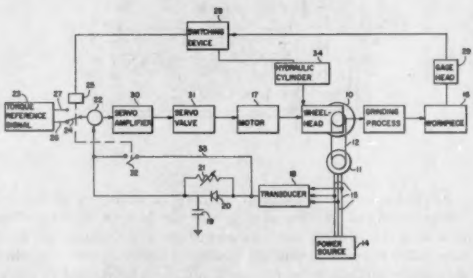


A machine for sharpening cutting tools by means of a grinding wheel, particularly cutting bits of mining machinery, comprises a series of units mounted on a general bed and grouped by a common system of electro- and hydraulic drives, each unit including a support with a clamping device for holding and rotating the workpiece when sharpening, and a spindle head having a sleeve with a drive and a spindle with a grinding wheel. The spindle is mounted in the sleeve and an elastic link connects the sleeve to the body of the machine such that the force from the grinding wheel interacting with the workpiece is opposed and controlled by this link. When dressing the grinding wheel, the elastic link is locked by a power cylinder.

3,589,077
CONTROL FOR CUTTING TOOL

Ronald L. Lenning, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

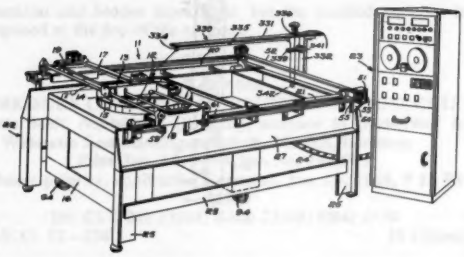
Filed June 5, 1968, Ser. No. 734,787
Int. Cl. B24b *49/00*
U.S. Cl. 51—165 **7 Claims**



A grinding wheel has its feedrate controlled in accordance with a force exerted on the grinding wheel when it is in

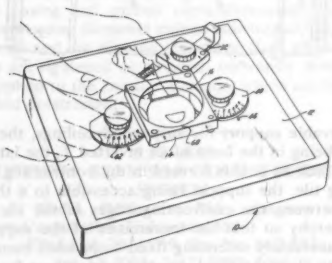
cutting engagement with the workpiece. The force is compared with a reference force, and the difference is utilized to select the feedrate of the grinding wheel into the workpiece. When the workpiece is reduced by the grinding wheel to a predetermined size, the reference force is changed.

3,589,078
SURFACE GENERATING APPARATUS
John L. Bala, Sudbury; Ronald Aspden, Bedford, and Peter W. Ford, Woburn, all of, Mass., assignors to Itek Corporation, Lexington, Mass.
Filed July 26, 1968, Ser. No. 747,887
Int. Cl. B24b *49/00*
U.S. Cl. 51—165 **48 Claims**



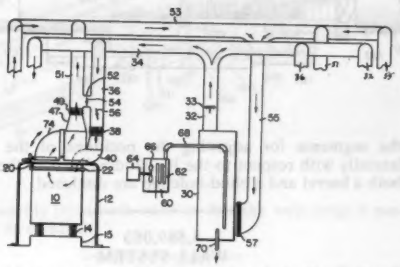
An apparatus for producing relative movement between a work surface and a surface modifying mechanism in two independently controllable component directions. An energizing circuit generates a predetermined path of relative movement in response to objective data input. By independently varying the velocity magnitudes of the components of relative movement, the energizing circuit insures the generation of a smooth travel path that is desirable for high quality surfaces.

3,589,079
BLOCK HOLDER FOR OPHTHALMIC LENS BLANKS
George A. Beasley, Fort Lauderdale, Fla., assignor to Univis, Inc., Fort Lauderdale, Fla.
Continuation-in-part of application Ser. No. 675,967, Oct. 17, 1967, now Patent No. 3,501,842. This application Nov. 17, 1969, Ser. No. 870,587
Int. Cl. B24b *19/00*
U.S. Cl. 51—277 **10 Claims**



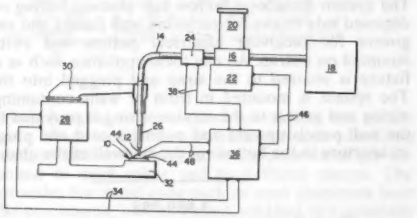
An apparatus is provided for blocking a lens blank which has associated therewith reference means for cooperating in alignment of the blank prior to blocking. The apparatus includes means to accurately position the block immediately above the blank in a predetermined relationship to the prescribed optical and geometrical properties of the finished lens.

3,589,080
PROCESS FOR FINISHING SPECTACLE FRAMES AND PARTS THEREOF
Robert S. Abbey, Rochester, N.Y., assignor to Textron Inc., Providence, R.I.
Filed June 25, 1968, Ser. No. 739,689
Int. Cl. B24b *1/00*
U.S. Cl. 51—314 **6 Claims**



Plastic spectacle frames and parts for such frames, such as fronts, temples, and top rims are finish-polished by tumbling them in a barrel containing also scrap pieces of the plastic, pumice and conventional waxy polishing material, while maintaining the contents of the barrel refrigerated.

3,589,081
ABRADING METHOD
Walter Kilischenko, Staten Island, N.Y., assignor to Penwalt Corporation
Original application Aug. 21, 1967, Ser. No. 662,112, now Patent No. 3,534,503, dated Oct. 20, 1970. Divided and this application June 3, 1969, Ser. No. 843,266
Int. Cl. B24c *1/00*
U.S. Cl. 51—319 **4 Claims**

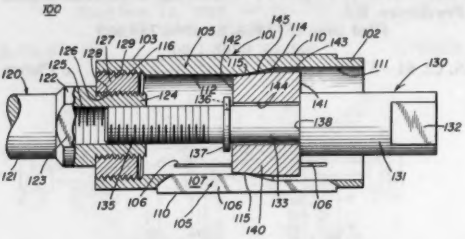


Miniature electrical resistors having a resistive film on a nonconductive substrate are abrasively trimmed to increase their resistance to a desired value by moving an abrasive jet between the resistor terminals, while measuring the rate of resistance increase, and then stopping and reversing the movement of the jet at a projected point in time when resistance has increased to the desired value. Capacitors and other electrical elements can be trimmed by this method.

3,589,082
LAPS
Paul F. Sodayko, Westchester, Ill., assignor to Nibot Corporation, Chicago, Ill.
Filed Sept. 8, 1969, Ser. No. 855,830
Int. Cl. B24b *9/02*
U.S. Cl. 51—340 **9 Claims**

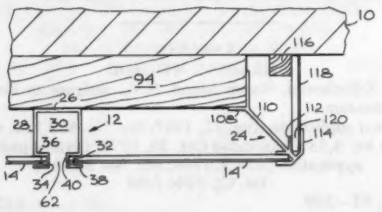
A lap for lapping the surfaces of holes having a diameter of at least about one inch, comprising a lapping cylinder having a plurality of segments thereon each having a lapping surface on the outside thereof and a bearing surface of essentially line contact on the inside thereof, a shank secured to the

cylinder and threadedly supporting an adjusting screw that in turn rotatably supports an adjusting collar, the adjusting collar having a conical surface engaging the bearing surfaces on



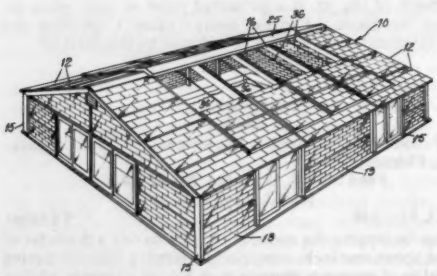
the segments for adjusting the positions of the segments laterally with respect to the longitudinal axis of the cylinder; both a barrel and a blind-hole lap are disclosed.

3,589,083
WALL SYSTEM
Ben J. Scalfani, Jr., Arcadia, Calif., assignor to Lightcraft of California, Incorporated, a division of Nutone-Scovill, Los Angles, Calif.
Filed Mar. 20, 1969, Ser. No. 808,862
Int. Cl. E04b *2/78*
U.S. Cl. 52—27 **7 Claims**



A system for erecting and electrifying walls is disclosed. The system includes a hollow box channel having outwardly disposed side tracks for receiving wall panels and an internal groove for receiving electrical outlets and switch units mounted on a strap. An electrical appliance such as a lighting fixture is secured to the strap and plugged into the outlet. The system is mounted in front of walls containing service wiring and access to the service wiring is provided by sliding the wall panels upward and pulling a cord and plug through an aperture in the bottom of the sidewall of the channel.

3,589,084
TRANSLUCENT WALL-PANEL ENCLOSURE
George P. Reed, III, Manchester, N.H., assignor to Kalwall Corporation, Manchester, N.H.
Filed Apr. 3, 1969, Ser. No. 813,265
Int. Cl. E04b *7/16*
U.S. Cl. 52—90 **7 Claims**

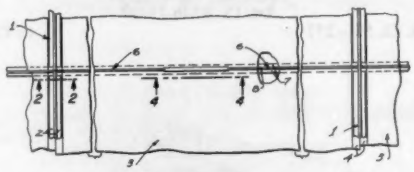


This invention relates to a translucent wall-panel enclosure of panel and beam construction with movable roof sections for use, for example, over a swimming pool, or other desired area.

3,589,085
SKIRTING MEANS
Raymond W. Sickler, R.D. #2, Wellsburg, N.Y.
Filed Feb. 26, 1969, Ser. No. 802,395
Int. Cl. E04g *9/06, 11/00*
U.S. Cl. 52—126 **8 Claims**

A plurality of vertically extending posts are disposed between the lower edge of a trailer and the ground. Integral tabs are struck from the material of the posts and these tabs serve to support a plurality of horizontally disposed parallel panels. The lower portion of an upper panel includes a longitudinally extending recess in the bottom portion thereof which receives the upper edge of a panel disposed therebelow to interlock the panels with one another. The other edges of the panels are held in place by the tabs on the posts to thereby support the panels in operative position.

3,589,086
REMOVABLE SUSPENDED CEILING SUPPORT
Roland Kurt Schilling, 6001 Altmark Ave., Whittier, Calif.
Filed Aug. 11, 1969, Ser. No. 848,832
Int. Cl. E04b *5/55*
U.S. Cl. 52—127 **12 Claims**

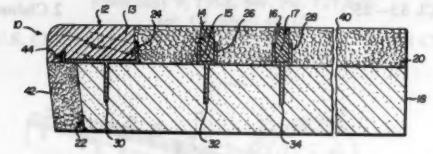


A removable support for suspended ceilings, the support generally being in the form of an inverted T, the lateral portions of which fit in slits formed in the confronting edges of the ceiling tile; the support being accessible to a thin blade inserted between the confronting edges of the tile and extended thereby so that the extremities of the support may rest on transversely extending fixed suspension members, or retracted to clear the fixed suspension members for removal of a selected ceiling tile.

3,589,087
TERRAZZO AND STRIP CONSTRUCTION
James De Lazzero, 4249 S.W. 51st St., Fort Lauderdale, Fla.
Filed Jan. 6, 1969, Ser. No. 789,336
Int. Cl. E04f *11/16*; **B44d** *5/08*
U.S. Cl. 52—181 **2 Claims**

A construction for floors, steps, or the like having a grip strip or color strip mounted in terrazzo material. The strip in-

cludes a member composed of binder and aggregate molded in a metal retainer. The retainer is embedded in terrazzo



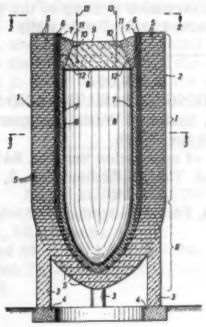
material and hidden from sight, but the molded member is exposed at the top of the terrazzo.

3,589,088

PRESSURE CONTAINER OF PRESTRESSED CONCRETE

Otto Seidl, Neubiberg, Germany, assignor to Dyckerhoff & Widmann Kommanditgesellschaft, Munich, Germany

Filed Jan. 14, 1969, Ser. No. 791,065
Claims priority, application Germany, Jan. 16, 1968, P 16 84 643.8
Int. Cl. G21c *13/08*; B28b *23/08*; E04c *3/10*
U.S. Cl. 52—224 **10 Claims**



A pressure container for a nuclear reactor made of prestressed concrete in which annular prestressing elements are disposed in spaced relation proximate the inner wall of a concrete casing and extend circumferentially thereof and radial prestressing elements extend transversely of the annular elements and are secured thereto so that, when the radial elements are tightened or stressed, outwardly directed pressure is applied to the annular elements which are thereby expanded and prestressed.

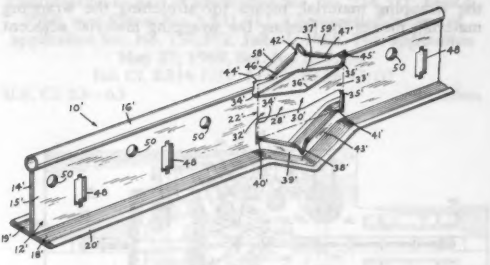
3,589,089

STRUCTURAL BEAM FOR CEILING SUSPENSION SYSTEM

Michael J. Kedel, Baltimore, Md., assignor to Eastern Products Corporation, Columbia, Md.

Filed Oct. 20, 1969, Ser. No. 867,553
Int. Cl. E04c *2/42*; E04b *1/98*
U.S. Cl. 52—232 **10 Claims**

A structural beam member comprising a pair of elongated metal strips disposed in side-by-side abutting relationship to form an upstanding web, an elongated rib joining the top of the strips, and an elongated flange extending laterally from each side of the base of the web, so that the beam has substantially an inverted tee cross section. The web portion includes an expansion relief space of generally rectangular configuration. The margins of the expansion relief space, parallel to the longitudinal axes of the flange and rib portions, have opposed cutout triangular notches extending into the web and rib portions. A strap of the web portion longitudinally spans the expansion relief space. The width of the web strap



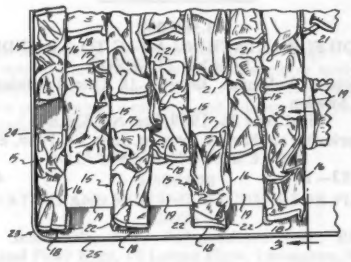
tapers inwardly from both ends so that the web strap is narrowest at its middle.

3,589,090

SCREEN METHOD AND APPARATUS

Walter Dittmer, Jr., 226 N. Orange Blossom Trail, Longwood, Fla.

Filed Aug. 21, 1969, Ser. No. 851,967
Int. Cl. E04c *2/08*
U.S. Cl. 52—633 **12 Claims**



A screen apparatus and a method for making the screen apparatus in which metal cans are reshaped and assembled into a screen of uniformly reshaped metal cans which are fixedly attached to each other and to a frame means. The method provides for metal cans such as used aluminum beer cans, to be precleaned; then reshaped, crushed in a generally uniform manner and the crushed cans more thoroughly cleaned. The cleaned and reshaped cans are then assembled and fixedly attached to each other such as with an epoxy glue, mechanical, or other means and attached to a framework. The assembled screen may then be coated to provide a more esthetic screen.

3,589,091

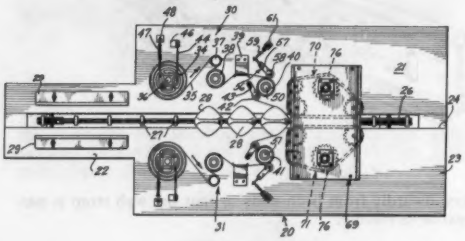
METHOD AND APPARATUS FOR WRAPPING OR LABELING A PACKAGE

Charles E. Cloud, Wilmette, Ill., assignor to Cloud Machine Corporation, Skokie, Ill.

Filed Sept. 6, 1968, Ser. No. 758,030
Int. Cl. B65b *53/00*
U.S. Cl. 53—14 **13 Claims**

A method of applying a label or a wrapping to a package, wherein the label material has a memory characteristic, i.e. when stretched, the material slowly shrinks toward its original size, comprising the steps of: stretching the material; wrapping the material loosely around the container to be labeled or wrapped; cutting the wrapping material to the proper size; sealing the adjacent ends of the wrapping material to form a loose fitting wrap around the package; and allowing the wrapping material to shrink toward the original

size thereof to form a tightly fitting wrap around the package. One of several apparatus for performing the above-described method includes: a supporting frame providing a horizontally disposed surface; means for supplying a continuous strip of the wrapping material; means for stretching the wrapping material; means for feeding the wrapping material adjacent



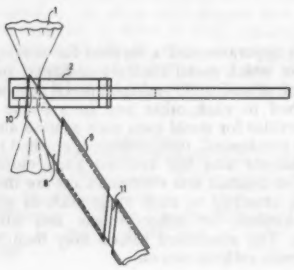
to the container in a configuration approximating the shape of the container to be wrapped; means for cutting and sealing the wrapping material to form a loosely fitting band or wrap around the container; and means for conveying the containers to a position for receiving the wrapping material and also to a position wherein the wrapping material will be cut and sealed by the sealing means.

3,589,092

METHOD FOR ATTACHING A TAG TO A BAG DURING CLOSING THEREOF

Harry Sigurd Valdemar Jarund, 18 Otto Lindbladsvagen, Lund, Sweden

Filed June 26, 1969, Ser. No. 836,861
Claims priority, application Sweden, June 27, 1968, 8,810/68
Int. Cl. B65b *61/14*; **B65d** *33/00*
U.S. Cl. 53—14 **4 Claims**



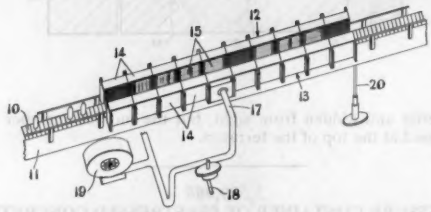
A bag is conventionally gathered at one end in preparation for placing a sealing tape around the gathered end of the bag. The longitudinal axis of the bag extends through the gathered end of the bag so that the tape will surround this axis. Prior to placing the tape around the gathered end of the bag, a tag is situated between the tape and the gathered end of the bag. This tag is positioned so that it extends angularly with respect to the longitudinal bag axis, at an angle greater than 90° but less than 180°. As a result, when the tape is extended around the gathered end of the bag, not only is the gathered end of the bag held closed by the surrounding tape but in addition the tape serves to fix to the bag the tag which extends angularly from the bag at its closed end so that any information on the tag is readily visible.

3,589,093

INFRARED HEATING OF FILLED GLASS BOTTLES

Herbert C. Snyder, Brockway, Pa., assignor to Brockway Glass Company, Inc., Brockway, Pa.

Filed Feb. 7, 1968, Ser. No. 703,618
Int. Cl. B65b *63/08, 55/14*; **B67b** *3/00*
U.S. Cl. 53—25 **2 Claims**



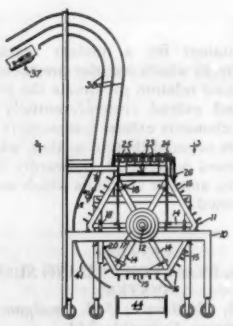
A method of avoiding harmful effects of moisture condensing on the surface of filled beverage bottles by passing the bottles from the filling and capping machines through a zone where they are subjected to infrared heat in a general wavelength range between 1.5 microns and 3.5 microns to raise the liquid temperature in the capped bottles to room temperature without excessive heating of the glass bottles or the liquid closely adjacent to the bottle walls.

3,589,094

CARTON-LOADING APPARATUS AND METHOD

Reinhold A. Pearson, Spokane, Wash., assignor to R. A. Pearson Company, Spokane, Wash.

Continuation-in-part of application Ser. No. 841,710, July 15, 1969, now abandoned. This application Feb. 2, 1970, Ser. No. 7,580
Int. Cl. B65b *5/08, 21/14*
U.S. Cl. 53—35 **13 Claims**



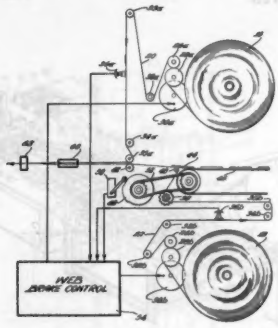
Articles, such as containers, are directed onto the peripheral side surfaces of a wheel rotatably mounted about a horizontal axis. After each side surface of the wheel receives a load of articles, the wheel is momentarily released to permit limited rotational movement about the axis due to the unbalanced load arrangement on the wheel and the force of gravity. The articles are inserted into cartons as the wheel rotates. The cartons and included articles are released after being inverted due to wheel rotation.

3,589,095

METHOD AND APPARATUS FOR REGISTERING TWO SEPARATE WEBS OF WRAPPING MATERIAL

Robert C. James, and Donald William Durow, both of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed May 9, 1968, Ser. No. 727,828
Int. Cl. B65b *41/18*
U.S. Cl. 53—51 18 Claims



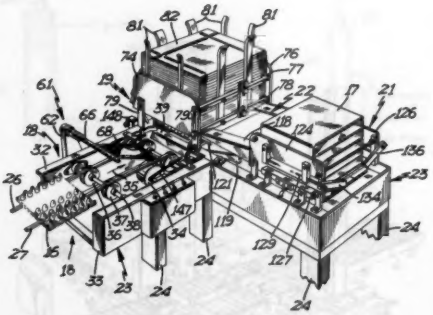
A packaging machine adapted to maintain plural webs in registry with a product, including electric eyes disposed in sensing relationship to each web. An infeed conveyor supplies the product. A cam and switch responds to the position of the product relative to the webs one or all of which may be stretchable, and a web brake control system is responsive to signals from the electric eyes and the cam to brake one or all of the webs in order to maintain the webs in registry with one another and the product. The method of maintaining webs of film in registry is also disclosed.

3,589,096

PACKAGING MACHINE

Richard T. Podvin, Minneapolis, Minn., assignor to RPR Industries, Inc., Minneapolis, Minn.

Filed Mar. 10, 1969, Ser. No. 805,741
Int. Cl. B65b *43/28, 51/14, 57/14*
U.S. Cl. 53—59 19 Claims



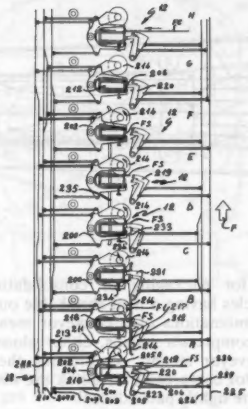
A machine for automatically placing articles into a carton and automatically closing and sealing the ends of the carton. The machine has a suction mechanism for removing a carton from the bottom of a stack of cartons and erecting the carton in alignment with an infeed conveyor. The mouth of the carton is held open by a movable ramp which directs the articles from the infeed conveyor into the carton. A transfer mechanism moves the carton from the loading station to a sealing unit having heating units which seal the closed ends of the carton. An elevator below the sealing unit operates to elevate the sealed carton.

3,589,097

CIGARETTE PACKERS

Goffredo Gianese, Bologna, Italy, assignor to A.M.F. Incorporated

Continuation-in-part of application Ser. No. 734,371, June 4, 1968, now Patent No. 3,531,911, Continuation-in-part of application Ser. No. 734,372, June 4, 1968. This application May 27, 1969, Ser. No. 828,255
Int. Cl. B31b *1/30, 11/26;* B65b *43/10*
U.S. Cl. 53—63 9 Claims



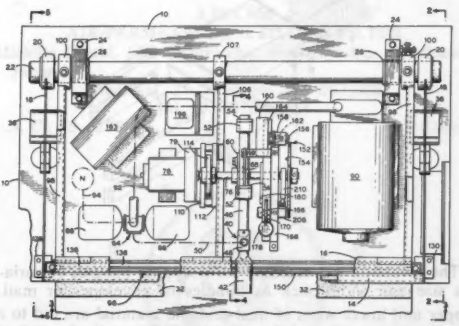
A cigarette packer in which the foil and paper webs are formed into discrete packages on a successive series of arbors contained on an endlessly moving conveyor including means for positioning, wrapping and folding the webs in successive order about the arbor.

3,589,098

EVACUATING AND SEALING MACHINE FOR PLASTIC BAGS

Herbert Schainholz, 3777 Independence Ave., Riverdale, N.Y., and Peter Katz, 18 Locust Place, Livingston, N.J.

Filed Sept. 15, 1969, Ser. No. 857,905
Int. Cl. B65b *31/06*
U.S. Cl. 53—79 7 Claims



An evacuating and heat-sealing machine for thermoplastic bags has a controller and power-driving mechanism including a plurality of commonly driven cams, a first cam causing withdrawal of a bag-evacuating nozzle, a second cam applying a pressure bar to the bag to be sealed, a third cam providing means for varying the length of the heater period, and a fourth cam controlling the length of the sealing period. All of the cams are driven simultaneously to provide parallel operation of sealing machine functions.

3,589,099

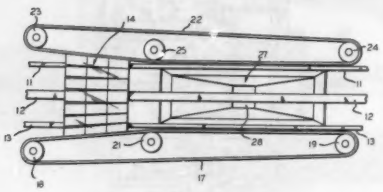
APPARATUS FOR PACKAGING ARTICLES

Robert C. James, Sheboygan, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Continuation of application Ser. No. 649,399, May 12, 1967, now abandoned , which is a division of application Ser. No. 432,307, Feb. 12, 1965, now Patent No. 3,362,128. This application Feb. 10, 1969, Ser. No. 800,818

Int. Cl. B65b *13/20*

U.S. Cl. 53—124 **6 Claims**



Apparatus for packaging or consolidating individually packaged articles having a heat shrinkable outer wrapper includes the combinations of a conveyor means transporting the articles, compressor means, either alone or associated with said conveyor means, compressing the articles being conveyed and/or compressed to shrink the wrapper into conformity with the tightly packed stack.

3,589,100

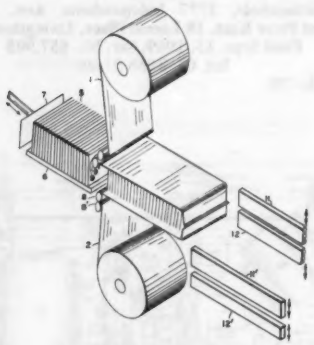
DOUBLE WEB PACKAGING MACHINE

Clement R. Konars, Glen Cove, N.Y., and Arthur Hall, Norwalk, Conn., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Apr. 3, 1969, Ser. No. 812,987

Int. Cl. B65b *11/12, 63/02*

U.S. Cl. 53—124 **7 Claims**



The invention is a machine for wrapping bundles of variable size and width such as bundles of envelopes or mail. Upper and lower webs of heat-sealable material are fed to a first location and sealed together. The bundle is pushed against the sealed webs and the webs are then end-sealed at the rear of the bundle. The end-sealed bundle is then moved to a second location on a collapsible table and the sides of the webs are sealed. One of the side-sealing means is movable so as to accommodate variable width bundles. Excess wrapping material is then cut off one or both the sides and the bundle ejected. This invention relates to means for wrapping bundles of mail of variable size in heat-sealable plastic.

3,589,101

APPARATUS FOR FILLING A CARTON WITH GLASS JARS OR THE LIKE

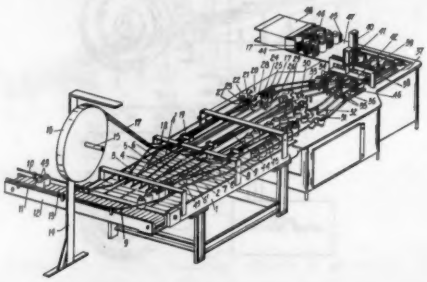
Hermanus N. Bavinck, Breda, Netherlands, assignor to N.V. Machinefabriek Breda voorheen Backer & Rueb Breda, Netherlands

Filed Jan. 15, 1969, Ser. No. 791,293

Claims priority, application Netherlands, Jan. 15, 1968, 6800592

Int. Cl. B65b *35/54, 61/00*

U.S. Cl. 53—128 **5 Claims**



A method and apparatus for providing a filling of a carton with glass jars wherein for each row of the filling the jars are supplied in two contiguous rows with a strip of cardboard placed vertically between them, the first jars of said rows being alternately pushed transversely to form a single row, said strip assuming a corrugated form around the jars, and a front portion of said single row together with the corresponding portions of the other single rows formed being pushed into a carton open at the side.

3,589,102

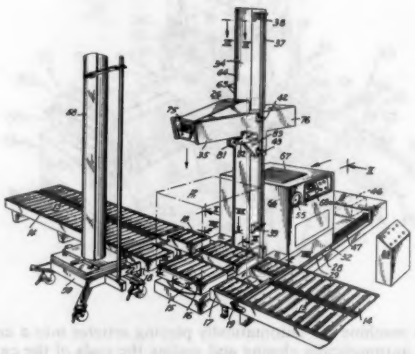
ROTARY METHOD AND APPARATUS FOR WRAPPING A PALLET LOAD

Seymour Zelnick, Orange, N.J., assignor to Weldotron Corporation, Newark, N.J.

Filed Nov. 5, 1968, Ser. No. 783,446

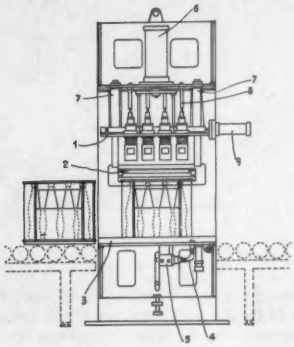
Int. Cl. B65b *53/06*

U.S. Cl. 53—184 **8 Claims**



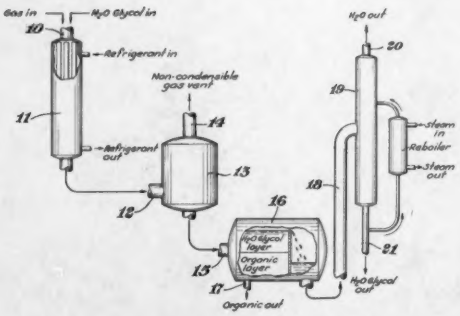
Apparatus for shrink wrapping an object comprises a rotary platform for rotating an object wrapped in a heat-shrinkable film and heat-shrinking apparatus for heat shrinking the film around the object during rotation of the rotary platform. The heat is provided as hot air blown on the object in vertically and horizontally extending lines.

3,589,103
MACHINES FOR UNSCREWING CAPS OR STOPPERS FROM CONTAINERS
Luis B. Calvillo, Calle de la Paz 24, and Martin G. Martinez, Avda Calvo Sotelo 28, both of Zaragoza, Spain
Filed June 17, 1969, Ser. No. 833,998
Claims priority, application Spain, Jan. 11, 1968, May 17, 1969, 355,371;367,352
Int. Cl. B65b *43/40*
U.S. Cl. 53—381 15 Claims



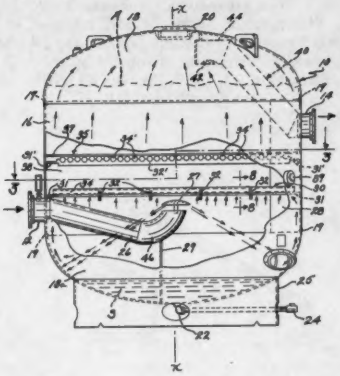
This machine includes vertically displaceable guides carrying working heads which in turn carry the unscrewing elements. All elements are automatically correlated by hydraulic or pneumatic means.

3,589,104
RECOVERY OF CHEMICALS FROM OFF-GASES
John E. Panzarella, Lake Jackson, Tex., assignor to The Dow Chemical Co., Midland, Mich.
Filed June 26, 1969, Ser. No. 836,913
Int. Cl. B01d *19/00*
U.S. Cl. 55—32 10 Claims



An improved method for the recovery of valuable organic compounds and deleterious air polluting chemicals from water-containing process off-gases which comprises (1) contacting the process off-gases with a cold surface upon which a film of water-miscible liquid is maintained; (2) separating the noncondensible gases from the condensate which forms upon contact of the off-gases with the cold wall and the water-miscible liquid; (3) separating the water-miscible liquid, water and condensate one from the other; (4) returning the water-miscible liquid to the first step to form the film on the cold wall and (5) recovering the condensates free of the water-miscible liquid and water.

3,589,105
DELIQUESCENT DESICCANT GAS DRYER
Philip S. Becker, Erie, and Martin C. Krause, Wattsburg, both of, Pa., assignors to Van-Air Inc.
Filed Jan. 23, 1969, Ser. No. 793,256
Int. Cl. B01d *53/14*
U.S. Cl. 55—221 18 Claims



A deliquescent desiccant-type air or gas dryer comprising a housing with a gas inlet and a gas outlet, and with a novel double grid arrangement dividing the housing into an upper chamber, an intermediate chamber and a lower chamber. The upper grid is adapted to support a gas pervious bed of chemical deliquescent desiccant material in particle or pellet-like form thereon and the lower grid spaced downwardly from the upper grid, is adapted to prevent the desiccant solution originating from the desiccant bed and collected in the bottom of the dryer housing, from being splashed up into contact with the underside of the bed of desiccant material, and is also adapted to diffuse the incoming gas prior to its contact with and passage into the desiccant bed, resulting in a dryer that has more uniform flow of gas through the desiccant bed, thus resulting in a more effective and efficient drying operation. Moreover, a novel gas inlet arrangement is provided for directing inlet gas upwardly away from the lower portion of the dryer housing where the desiccant solution collects, to aid in preventing contamination of inlet gas while diffusing the inlet gas and reducing the velocity of the gas stream at its entry into the dryer housing.

3,589,106
AIR-PERMEABLE STERILIZER FILTER
Michiko Onuki, 688 Nishiya-cho, Hodogaya-Ku, Yokohama, Japan
Filed Mar. 17, 1969, Ser. No. 807,806
Int. Cl. B01d *39/02*
U.S. Cl. 55—279 7 Claims

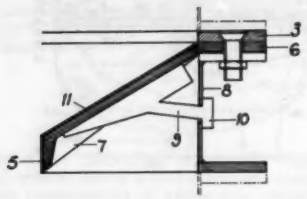
A filter for sterilizing the air at site of a telephone mouthpiece, a speaking window and an air outlet of an air-conditioning system. A porous sheet member is impregnated

with a sterilizer solution which acts to sterilize the air before it is breathed in. The sheet member has a coating film which is adapted to keep the filter clean and to control the evaporation of the sterilizer solution.

3,589,107
AUTOMATICALLY CONTROLLED CLOSURE ASSEMBLIES

Desmond H. Vines, Rosebank, Johannesburg, Transvaal Province, Republic of South Africa, assignor to Hilmac Consultants Proprietary Ltd., Braamfontein, Johannesburg, Transvaal Province, Republic of South Africa

Filed Mar. 27, 1969, Ser. No. 811,101
Int. Cl. B01d *45/18*
U.S. Cl. 55—432 **5 Claims**

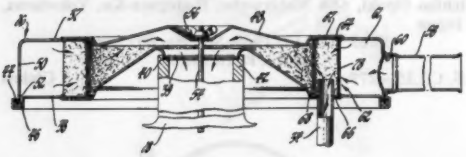


A closure assembly for dust-separating equipment or the like comprising a flexible member made of at least three separate sector-shaped elements assembled to complete a circular shape, a peripheral support for the member providing means for securing the assembly in position and applying predetermined loading of the elements to maintain them in a circular shape in plan.

3,589,108
AIR CLEANER FOR CRANKCASE VENTILATION SYSTEM

Ronald J. Dingel, Warren, and Wesley D. Tomlinson, Rochester, both of, Mich., assignors to General Motors Corp., Detroit, Mich.

Filed May 21, 1969, Ser. No. 826,374
Int. Cl. B01d *27/06*
U.S. Cl. 55—482 **2 Claims**

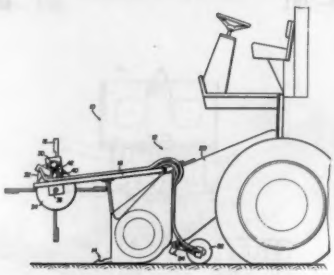


An air cleaner for a closed positive crankcase ventilation system includes an air filter having a pleated filter element which has an enlarged pleat outwardly surrounding the air intake for the ventilation system and a cylindrical filter element disposed inwardly of the pleats and defining with the enlarged pleat a filtering chamber in which the air flowing through the ventilation system to the crankcase during normal engine operating conditions is filtered by the enlarged pleat and the excess blowby gases and crankcase vapors flowing from the crankcase to engine carburetor during high-speed operation of the engine are filtered by the cylindrical filter element.

3,589,109
CONTROL SYSTEM FOR FLUID MOTOR

Amos O. Payne, Eldridge, Iowa, assignor to J. I. Case Co., Racine, Wis.

Filed Feb. 14, 1969, Ser. No. 799,198
Int. Cl. A01d *41/02*
U.S. Cl. 56—10.2 **8 Claims**

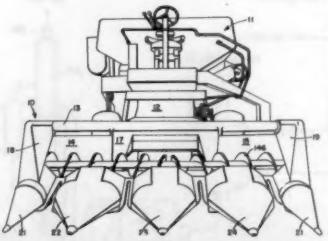


A speed control unit for controlling the speed of a device driven by a hydraulic motor and in which the speed of the device is controlled by the flow of pressured fluid to the fluid motor. The speed control unit includes a first element which is rotated as a function of the speed of the harvesting machine and a second element which is rotated as a function of the speed of the device with means for automatically varying the flow of fluid whenever either of the element's rotational speed is varied.

3,589,110
GEAR DRIVE AND SUPPORT FOR CORN-HARVESTING UNIT

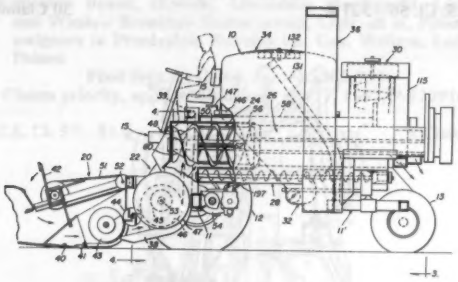
Lester Dale Schreiner, Ankeny, and Joseph John Shindelar, Des Moines, both of, Iowa, assignors to Deere & Co., Moline, Ill.

Continuation of application Ser. No. 662,928, Aug. 24, 1967, now abandoned. This application Jan. 21, 1970, Ser. No. 5,644
Int. Cl. A01d *45/02*
U.S. Cl. 56—11.7 **18 Claims**



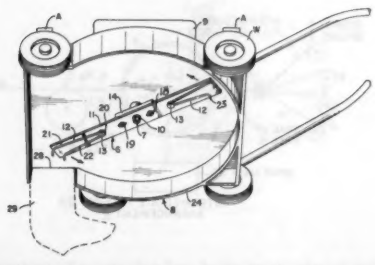
A support and drive for a corn-harvesting unit that includes a gear housing adapted for transverse adjustment along a transverse beam and having a transverse shaft-receiving opening that permits adjustment of the gear housing along a transverse drive shaft, a corn-harvesting unit framework supported at its rear end on the gear housing whereby the framework in the corn-harvesting mechanism carried on the framework is supported in cantilever fashion on the gear housing, and gear mechanism within the gear housing having external terminal portions connected to the harvesting mechanism whereby the entire harvesting mechanism is driven by gears within the gear housing and the harvesting mechanism and its framework is supported on the gear housing.

3,589,111
COMBINE HARVESTER
Myron Leroy Gullickson, Scotland, Ontario, and Donald Hector McNeill, Brantford, Ontario, both of, Canada, assignors to White Motor Corp. of Canada, Ltd., Brantford, Canada
Filed Feb. 24, 1969, Ser. No. 801,349
Claims priority, application Canada, Apr. 17, 1968, 017,685
Int. Cl. A01d *41/02*
U.S. Cl. 56—12.8 48 Claims



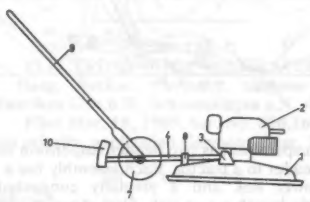
A field crop harvester comprising a four-wheel vehicle with a crop-gathering header at the forward end having a sickle cutter and associated apparatus for gathering grain crops and delivering the same to a feeder blower which raises the material into the cone-shaped end of a horizontally disposed threshing cylinder which is mounted on an axis extending longitudinally of the vehicle frame, a horizontally disposed separator mounted on the same longitudinally extending axis and having an auger within a perforated tube which advances the material to a discharge opening at the rear of the tube, the threshing cylinder and separator extending through a grain storage tank disposed forwardly of the center of the vehicle and having associated grain augers disposed horizontally on parallel shafts which carry the separated grain from the threshing cylinder and the separator to a vertically disposed cleaner at the rear of the vehicle, which cleaner includes an auger mounted on a vertical axis enclosed within a perforated tube, which in turn is mounted in a cylindrical housing with a fan at the top for drawing the trash into a discharge chute while the grain thrown through the perforated tube drops to a collecting pan at the bottom and is directed into a slinger for transfer through a cooperating chute to a storage tank from which it may be withdrawn through an unloader slinger and chute.

3,589,112
THATCHER ATTACHMENT FOR ROTARY TYPE LAWNMOWER
Lester H. Frohmader, R. #8, Box 114, Rockford, Ill.
Filed Aug. 25, 1969, Ser. No. 852,620
Int. Cl. A01d *51/00*
U.S. Cl. 56—17.5 10 Claims



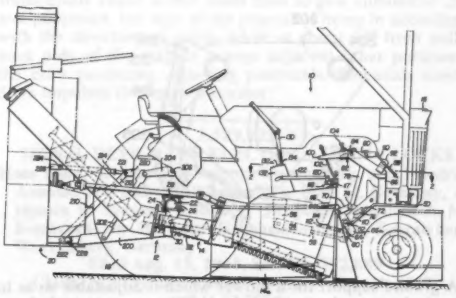
A pair of generally V-shaped spring wire rake members are carried at the same radius on opposite ends of an elongated bar that is mounted at its midpoint on the lower end of the vertical driven shaft of the mower in lieu of the cutter blade. The rake members are both pivoted on vertical axes at their apex points to the underside of the bar to enable their swinging horizontally out of the way of any stone or other obstruction that might otherwise cause serious damage thereto and yet allow instant return of the rake members so deflected to normal radial operative position under centrifugal force, and the downwardly curved outer ends of each rake member are flexed upwardly by contact with the ground and are thusly maintained under spring pressure against the surface being raked and they operate at different radii to greatly increase the raking effectiveness of the attachment. Should either or both of the spring wire rake members be broken, or so badly bent out of shape as to require replacement, that is an easy matter as they are detachably secured in place by small bolts. These are shouldered to insure leaving the right amount of working clearance for pivotal movement of each rake member relative to the bar, regardless of how tightly the nuts may be fastened on the bolts.

3,589,113
DEVICE FOR STEERING AN AIR CUSHION SUPPORTED LAWN MOWER
Ernst Sture Lennart Svensson, Malmo, Sweden, assignor to Flymo Societe Anonyme, Geneva, Switzerland
Filed Nov. 14, 1969, Ser. No. 876,700
Claims priority, application Great Britain, Nov. 21, 1968, 55190/68
Int. Cl. A01d *35/26*
U.S. Cl. 56—12.8 5 Claims



A lawnmower of the kind having a rotary blade and a blower supporting the housing above the ground on a cushion of air is provided with a handle coupled to the housing by means of a pivotable linkage and a wheel resting upon the ground in such a manner that the distance of the mower above the ground is determined by the blower and not by forces acting upon the handle.

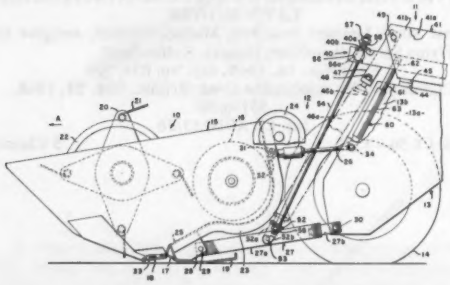
3,589,114
MOUNTING MECHANISM FOR HARVESTING MACHINE
Roy A. Gillette, Rockford, Ill., assignor to J. I. Case Company, Racine, Wis.
Filed Dec. 16, 1968, Ser. No. 784,154
Int. Cl. A01d *45/18*
U.S. Cl. 56—33 11 Claims



Mounting means for a harvesting mechanism for quick attachment and release of the mechanism from a vehicle. The

mounting mechanism supports the harvesting units forwardly of the main axle of the vehicle with means for simultaneously raising and lowering two units with respect to the vehicle and individual capability of adjustment and/or relative movement of each unit with respect to the vehicle and to the opposite unit. A collector unit is supported adjacent the axle on a side opposite the harvesting units and is carried on the conventional draft arms of a draft control mechanism forming part of the vehicle. The linkage means connecting the collector unit to the vehicle are arranged so as to maintain the collector unit in a substantially parallel plane at all times.

3,589,115
HEADER SUSPENSION
Charles P. Taylor, and Delmar C. Harer, both of New Holland, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Jan. 22, 1969, Ser. No. 792,997
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **8 Claims**

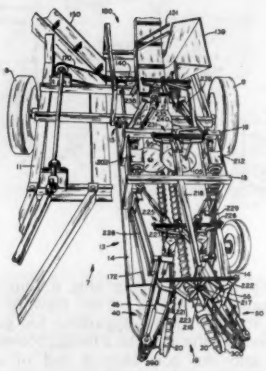


A header suspension has two header suspension assemblies attaching a header to a tractor. Each assembly has a pivotally connected lower link and a pivotally connected, spring loaded variable length upper link. Skid shoes at each end of the header rest on the ground to position the header for cutting crops. Hydraulic lifts raise the header to an inoperative transport position through a lift rod connected to the lower link and an arm pivotally mounted on the tractor. The lift rods limit the downward movement of the header on entering a depression in the ground.

3,589,116
REEL MOWER WITH ADJUSTABLE SUPPORT
Ralph W. Speiser, Minneapolis, Minn., assignor to Toro Manufacturing Corporation, Minneapolis, Minn.
Division of Ser. No. 390,704, Aug. 19, 1964, Pat. No. 3,410,063. Filed Oct. 17, 1968, Ser. No. 785,423
Int. Cl. A01d *55/20*
U.S. Cl. 56—249 **18 Claims**

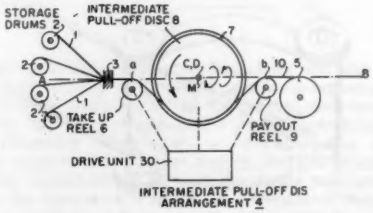
A ground support for a mower which is adjustable so as to selectively vary the height of cut. The support includes a curved skid, the front end of which is hingedly connected to the mower frame for vertical swinging movement relative to the frame. The skid is held in selected positions by an upstanding, elongate, longitudinally adjustable rod, the lower end of which is pivotally connected with the skid, the upper end of which is detachably suspended from one of a series of detents attached to the frame.

3,589,117
HARVESTING APPARATUS
William R. Wadsworth, Route 2, Clyde, Ohio
Filed Apr. 9, 1968, Ser. No. 719,888
Int. Cl. A01d *45/26*
U.S. Cl. 56—327 R **30 Claims**



A machine for harvesting vegetables having an edible head portion to be separated from a stem portion including a carriage to be advanced on the ground along a row of the vegetables, cutters on the carriage for trimming the stems from the heads, conveyor rollers for grasping and pulling down on a stem while conveying the stem and head to the cutter, and means for orienting the stem and head of a vegetable in that row for engagement by the stem-grasping means. The orienting means may include coacting lifting conveyor rollers on each side of the row to be advanced beneath a head and endless gathering conveyors having substantially vertically disposed and rearwardly moving runs supported in spaced opposing relationship on each side of the row to contact and center the heads. Second aligning side conveyors above the stem-grasping means and the cutter means provides a right angle stem cut.

3,589,118
INTERMEDIATE STORER DISC FOR APPARATUS FOR STRANDING A TWISTED UNIT OF A CABLE
Alfred Strelow, and Klaus Hascher, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany
Filed July 22, 1969, Ser. No. 843,687
Claims priority, application Austria, July 23, 1968, A7,116/68
Int. Cl. D01h *7/02*; **D07b** *3/02*; **H01b** *13/04*
U.S. Cl. 57—34 **6 Claims**



An intermediate pulloff disc in apparatus for stranding a twisted unit of a cable has a storage surface for the twisted unit and a plurality of grooves formed in such surface and ex-

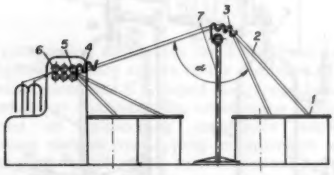
tending in the direction of the axis of revolution for at least part of the altitude of such surface. A tumbling deflector ring has a plurality of spaced teeth extending therefrom and engaged in the grooves of the storage surface for displacing a section of twisted unit stored in such surface.

3,589,119

DEVICE FOR FEEDING SPINNING MACHINES WITH A SLIVER

Kazimierz Braun, Otwock; Aleksander Wojtkowski, Lodz, and Wieslaw Bronislaw Sucharzewski, Lodz, all of, Poland, assignors to Przedzalnia Bawelny im. Gen. Waltera, Lodz, Poland

Filed Sept. 26, 1968, Ser. No. 762,755
Claims priority, application Poland, Oct. 7, 1967, P-122916
Int. Cl. D01h *5/28*
U.S. Cl. 57—51.6 **5 Claims**



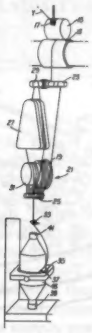
A device for feeding spinning machines with sliver which includes at least one false twist spiral arranged on a drawing or roving frame between the drawing mechanism and the can in order to insert an additional twist on short sections of the feeding sliver.

3,589,120

PROCESS FOR WINDING POLYAMIDE YARN PACKAGES WITH TAPERED END-PORTIONS

David Meredith Phillips, Stonehouse, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 648,685, June 26, 1967, Pat. No. 3,450,371.
Filed Nov. 29, 1968, Ser. No. 810,051
Int. Cl. D01h *1/36;* **B65h** *54/36*
U.S. Cl. 57—157 **2 Claims**



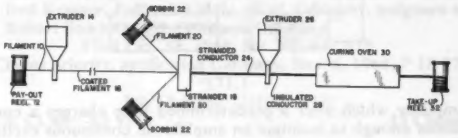
A method of producing low barre heat relaxed polyamide yarn packages with long-to-short build by means of a programmed central feed which maintains a constant traveler speed and correspondingly reduces the balloon tension.

3,589,121

METHOD OF MAKING FLUID-BLOCKED STRANDED CONDUCTOR

Bernard J. Mulvey, Fairfield, Conn., assignor to General Electric Company

Division of Ser. No. 678,920, Oct. 30, 1967, abandoned. Filed Aug. 1, 1969, Ser. No. 846,868
Int. Cl. H01b *13/14, 13/24, 13/26*
U.S. Cl. 57—162 **4 Claims**



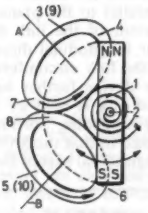
An insulated stranded conductor which is properly fluid blocked is manufactured by first coating a wire filament or strand, and then forming a stranded conductor with the coated filament as the center strand. An outer insulation is applied over the resulting stranded conductor under sufficient pressure to at least partially fill the interstitial spaces between the strands. The coating and insulation are formed of a curable polymeric composition, and the two materials, being in intimate contact, are cured at an elevated temperature and upon cooling, bond to each other, thereby substantially encapsulating all the strands of the conductor.

3,589,122

ELECTRODYNAMIC OSCILLATOR

Albrecht Haag, Neckar, Germany, assignor to Kienzle Uhrenfabriken G.m.b.H., Schwenningen a.N., Germany

Filed Mar. 18, 1969, Ser. No. 808,160
Claims priority, application Germany, Mar. 20, 1968, P 17 73 005.1
Int. Cl. G04c *3/04*
U.S. Cl. 58—28 **6 Claims**



An electrically driven oscillator for timepieces wherein at null position a turnable oscillatory barlike magnet sweeps transversely edges of two tilted coils to give cumulative control potentials, the sign of the potentials being in accordance with the direction of swing, while at about 90° from null at least pole of the magnet sweeps adjacent other portions of the coils producing opposing potentials. Potentials control drive impulses through a transistor.

3,589,123

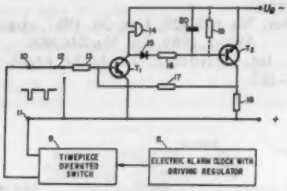
SIGNAL DEVICE FOR ELECTRIC ALARM CLOCKS

Hans Flaig, Schramberg-Sulgen, Wurttenberg, and Friedrich Assmus, Schramberg, Wurttenberg, both of, Germany, assignors to Messers. Gebruder Junghans Gesellschaft Mit Beschraenkten Haftung, Geisshaldenstrasse, Schramberg, Wurttenberg, Germany

Filed Aug. 15, 1968, Ser. No. 752,889
Claims priority, application Germany, Aug. 21, 1967, P 16 73 757.8
Int. Cl. G04c *9/00*
U.S. Cl. 58—38 **7 Claims**

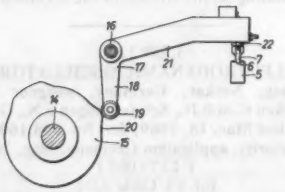
An electric clock having an electromagnetically operated movement regulator produces pulses therefrom to actuate a

signal device such as a bell or buzzer continuously without loading of the clock regulator device. Thus electric pulses are provided at a specified time by the clockwork to excite an



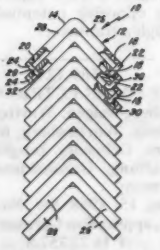
amplifier which after a predetermined time charges a condenser enough to maintain an amplifier in continuous excitation to operate the bell until a hand operated switch interrupts the circuit.

3,589,124
DEVICE FOR REMOVING THE BURR OF CHAIN LINKS
Paul Esser, Raderbergerstrasse 185, 5 Cologne-Raderberg, Germany
Filed June 5, 1968, Ser. No. 734,775
Int. Cl. B21l *15/00*
U.S. Cl. 59—29 **3 Claims**



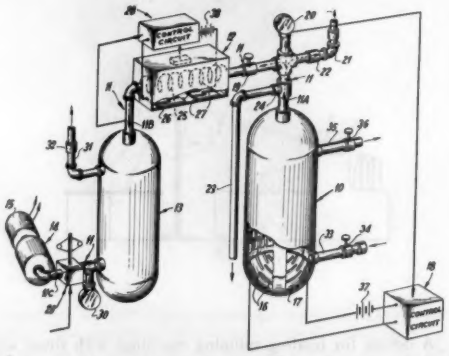
A burr-removing device for chain-welding machines has two knives located parallel to the plane of a C-shaped link and spaced to the extent of the link diameter, the knives being movable in their longitudinal direction for cutting off the weld ridge along the link circumference in two parallel tangential sectors, the device further having a fixedly held saddle upon which the link is held by two upsetting steels over its longitudinally extending portion, the device being particularly characterized in that the knives are movable perpendicularly to the longitudinal axis of the link.

3,589,125
FLEXIBLE BRACELET CONSTRUCTION
Max A. Hartmann, Warwick, R.I., assignor to Reibling Miller Tool Co., Providence, R.I.
Filed June 9, 1969, Ser. No. 831,392
Int. Cl. F16g *13/00*
U.S. Cl. 59—80 **6 Claims**



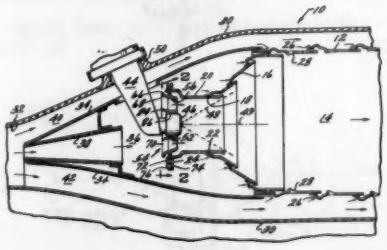
A flexible bracelet construction comprised of a plurality of interconnected links, each of the links being bent substantially at the midpoint thereof to define angularly directed end portions. A channel is formed in the body portion of each link and openings are formed in the end portions thereof. A tab is joined to the end portions of each link and is initially bent so as to be received in the opening of an adjacent link and is thereafter bent inwardly within the channel of the body portion of the adjacent link, the adjacent links thereby being fixedly and flexibly interconnected to form the flexible bracelet construction.

3,589,126
POWER SYSTEM
Theodore Zotto, 696 5th Ave., Troy, N.Y.
Filed Apr. 4, 1969, Ser. No. 813,521
Int. Cl. F01k *25/00*
U.S. Cl. 60—36 **5 Claims**



The production of power by the utilization of a supply of a gaseous working fluid under pressure to drive a turbine, wherein a substantially unlimited supply of working fluid is provided by the controlled evaporation of a reservoir of the working fluid in a liquefied state in accordance with pressure variations at an appropriate point in the system. Heating of the gaseous working fluid to a preselected temperature and pressure prior to utilization is advantageous.

3,589,127
COMBUSTION APPARATUS
Milton J. Kenworthy; Clifford C. Gleason, and Michael M. Bluestone, all of Cincinnati, Ohio, assignors to General Electric Company
Filed Feb. 4, 1969, Ser. No. 796,391
Int. Cl. F02c *3/00*
U.S. Cl. 60—39.37 **2 Claims**

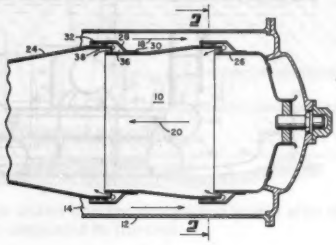


A combustion apparatus is disclosed having a closure member disposed about a fuel nozzle and formed with a plurality of radially elongated and mutually spaced slots for delivery of air into a combustion chamber as a plurality of discrete streams about and generally along the fuel spray axis so as to mix the air and fuel in a manner producing low smoke combustion.

3,589,128
COOLING ARRANGEMENT FOR A REVERSE FLOW GAS TURBINE COMBUSTOR

Ervin J. Sweet, Trumbull, Conn., assignor to Avco Corp., Stratford, Conn.

Filed Feb. 2, 1970, Ser. No. 7,856
Int. Cl. F02c *3/00*
U.S. Cl. 60—39.65 3 Claims

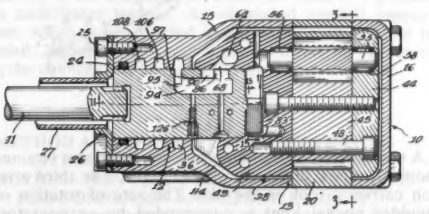


The compressed airflow for the compressor of a gas turbine engine is initially contra to the direction of flow of the combustion gases and is scooped and turned before entering the combustion chamber. The combustion chamber liner is comprised of telescoping combustor sections, each downstream section overlapping an upstream section. The adjacent sections are rigidly interconnected by means of an annular joint which provides an inlet scoop for the compressed air, a mixing chamber, and an annular efflux area for discharging air into the combustion chamber. The scoop is formed by corrugations on the joint welded to the outer periphery of the downstream section. The mixing chamber and efflux area are formed by welding the other end of the joint to the outer periphery of the upstream section.

3,589,129
PROPORTIONAL DIRECTIONAL CONTROL UNIT

Frederick W. Pollman, Rockford, Ill., assignor to Sundstrand Corp.

Filed Sept. 4, 1969, Ser. No. 855,152
Int. Cl. F15b *13/04*
U.S. Cl. 60—52 11 Claims

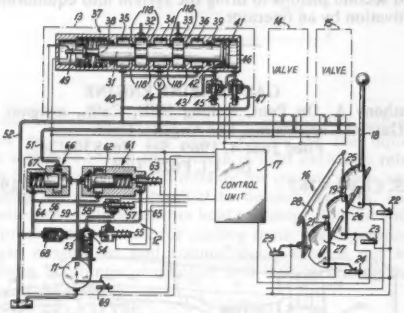


A hydraulic servo device which controls the delivery of high-pressure fluid in an amount proportional to a manual input signal including a rotary valve for supplying fluid to a rotary servo metering device that follows movement of the valve about the same axis delivering fluid to a remotely disposed actuator, with the servo metering device taking the form of a stationary internally toothed ring gear, a carrier supporting a plurality of planetary gears interengaging the stationary ring gear and defining therewith a plurality of expanding and contracting fluid chambers, there being provided in the rotary valve a supply port and two adjacent load ports which continuously communicate with the remote actuator for supplying fluid to and from the same, with a plurality of pressure-balancing recesses disposed oppositely in the rotary valve with respect to each of the ports in the valve, there being also provided two ports in the carrier for supplying fluid to and from the servo device so that the latter device acts in follow up action with respect to the rotary valve through the selective communication between the ports in the carrier and the supply port in the rotary valve. The rotary valve may be either of the closed center or open center type and may also be either load reactive or nonload reactive through the proper location of the load ports in the valve with respect to the two ports in the carrier member.

3,589,130
ELECTROHYDRAULIC REMOTE CONTROL OF HYDRAULIC VALVES

Heinz Flaschar, Ludwigsburg; Wilhelm Weigert, Schwieberdingen; Walter Werner, Waiblingen, and Manfred Kramer, Feilbach-Lindle, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 30, 1969, Ser. No. 872,673
Claims priority, application Germany, Nov. 6, 1968, P 18 07 171.1
Int. Cl. F15b *11/16, 15/18*
U.S. Cl. 60—52 VS 13 Claims



An arrangement for controlling remotely hydraulic valves located between a variable displacement pump and a load supplied from the pump. The valve has a control slider the position of which is indicated through a signal generator on the slider. Control levers are also coupled to the slider and the position of these levers is indicated through another signal generator coupled to the levers. A control unit connected to the signal generators, compares their signal outputs and actuates electrohydraulic positioning means for controlling the pump flow as a function of the deflection of the control levers.

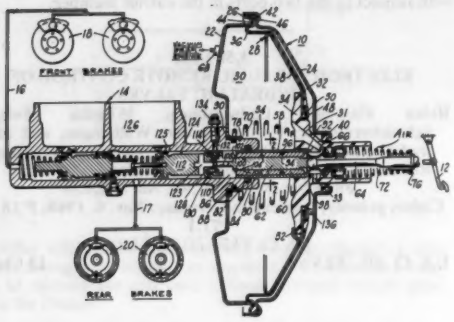
3,589,131
VEHICLE BRAKING SYSTEM

Frederick G. Grabb, South Bend, Ind., assignor to The Bendix Corp., South Bend, Ind.

Filed Mar. 24, 1969, Ser. No. 809,860
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.5 10 Claims

A pressure ratio changer for selectively responding to a first source of force and a second source of force to pressurize a fluid chamber. A first piston connected to the first source of force is slidably retained in the fluid chamber. A second piston concentrically carried by the first piston has its axial movement limited in one direction by a flange of the first piston. A third piston concentrically carried by the second piston has its axial movement restricted in both directions by a flange on one end and snap ring on the other. The third piston moves in response to an operator activation member to close the fluid communication between the master cylinder piston and the first and second pistons. Now,

the reactive force transmitted from the master cylinder piston is proportioned through a reactive chamber to the first and second pistons to bring the system into equilibrium upon activation by an operator.

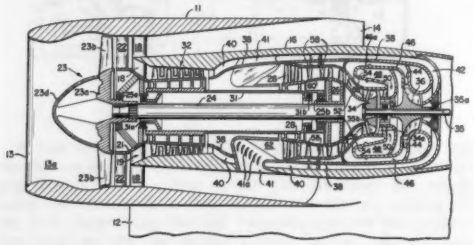


3,589,132

GAS TURBINE ENGINE

Anthony A. Du Pont, Rolling Hills, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed June 4, 1969, Ser. No. 830,336
Int. Cl. F02k *3/06*
U.S. Cl. 60—262 **19 Claims**



A gas turbine engine of the jet propulsion type wherein an intake fan on a first spool assembly draws air through an air inlet. Part of the air passes into an outer annular bypass duct and part passes through a second spool assembly compressor to be compressed to an intermediate pressure. The compressed air is ducted through a tubular duct to the aft end of the engine and turned through an angle of 180° inwardly into the inlet of a third spool assembly centrifugal compressor to be further compressed. The high-pressure air is then heated within a combustor and the combustion gases are expanded through three separate turbines that power the centrifugal compressor, the axial compressor, and the fan of the respective spool assemblies. The expanded gases are turned, approximately 125° outwardly and backwardly through an injector means into the outer annular bypass duct where they are intermixed with the air flowing therethrough. The mixture is jetted aft through a nozzle to produce forward thrust.

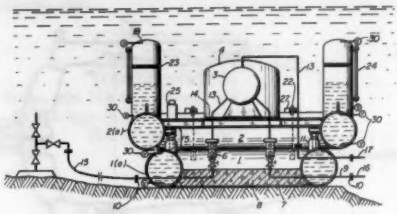
3,589,133

METHOD OF AND MEANS FOR MOUNTING EQUIPMENT AT A SUBSEA LOCATION

Judson D. Lowd; Ernest C. Hill, and Bill S. Burrus, all of Tulsa, Okla., assignors to Combustion Engineering, Inc., New York, N.Y.

Filed May 15, 1969, Ser. No. 824,790
Int. Cl. B63c *11/00*
U.S. Cl. 61—46.5 **4 Claims**

A structure for mounting equipment at a subsea location has a platform member and an anchor member, each with independently adjustable buoyancies. The two members are interconnectable and can be nested together for towing to their emplacement site, at which their buoyancies are sequentially adjusted, the anchor positioned, and the platform winched down and secured to the anchor. The platform is retrievable to the surface without an external power assist. The anchor member may also be retrieved if external power is available to blow the anchor ballast.

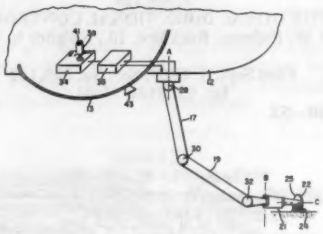


3,589,134

MANIPULATOR APPARATUS

Robert L. Hackmann, Glen Burnie, and Donald W. Hunt, Baltimore, both of, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 30, 1969, Ser. No. 872,704
Int. Cl. B25j *1/02*
U.S. Cl. 61—96 R **7 Claims**



A manipulator arm assembly having three arm sections and shoulder, elbow and wrist pivotal joints. The third arm section carries a tool or the like. The rate of rotation of the shoulder pivotal joint is commanded by an operator and signal processing equipment commands the other two pivotal joints such that the tool travels in a straight line.

3,589,135

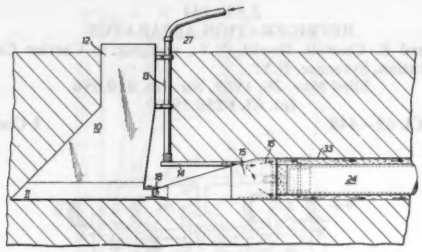
TRENCHLESS LAYING OF UNDERGROUND PIPES

Ainsley Neville Ede, 36 Thornton Way, Cambridge, England

Filed Mar. 13, 1969, Ser. No. 806,912
Claims priority, application Great Britain, Mar. 15, 1968, 12783/68
Int. Cl. F161 *1/00;* **E02d** *29/10;* **E02f** *5/18*
U.S. Cl. 61—72.1 **6 Claims**

A method of laying lengths of underground pipe, for example drainage pipes, by forming an underground tunnel by means of a mole plough, and drawing a length of pipe into the tunnel into its required final position, characterized in that a liquid slurry is injected into the tunnel formed by the mole before the pipe length is drawn into the tunnel, the slurry serving to lubricate the pipe during its travel along the tunnel. Preferably the principal ingredient of the slurry is

Bentonite. The pipe may be towed directly behind the mole and drawn progressively into the tunnel as it is formed or the pipe may be drawn into the slurry-filled tunnel after the mole plough has completed its traverse.

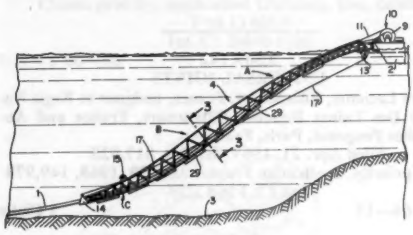


3,589,136

METHOD AND APPARATUS FOR CONTROLLING A CONDUIT DURING A LAYING OPERATION

James E. Sorenson, and Thomas J. Atterbury, both of Columbus, Ohio, assignors to Columbus Gas System Service Corporation, New York, N.Y.

Filed July 24, 1967, Ser. No. 655,566
Int. Cl. F16l *1/00*; B63b *35/04*
U.S. Cl. 61—72.3 **3 Claims**



This disclosure relates to a method and apparatus for controlling the curvature of a flexible continuous conduit during the delivery of the conduit from a marine vessel to a position on an underwater surface. An elongated conduit support member, which is constructed to permit its configuration to be varied, supports the conduit and controls its curvature during the delivery and laying of the conduit.

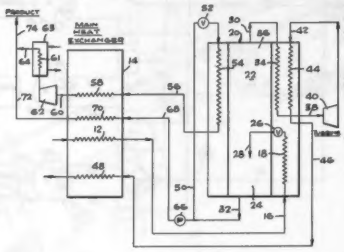
3,589,137

METHOD AND APPARATUS FOR SEPARATING NITROGEN AND HYDROCARBONS BY FRACTIONATION USING THE FLUIDS-IN-PROCESS FOR CONDENSER AND REBOILER DUTY

Michael L. Hoffman, Beverly Hills, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Oct. 12, 1967, Ser. No. 674,985
Int. Cl. F25j *3/08*
U.S. Cl. 62—23 **15 Claims**

System for the separation of gases, particularly of mixtures of a low-boiling hydrocarbon and nitrogen, e.g., a mixture of methane and nitrogen, which involves, according to one embodiment, providing a mixture of such low-boiling hydrocarbon and nitrogen at relatively high pressure, e.g., about 800 p.s.i., cooling the compressed gas mixture approximately to its saturation temperature, passing the cooled compressed mixture in heat exchange relation along the lower portion of a fractionating column operating at a pressure substantially lower than the pressure of the compressed gas mixture, and providing reboil heat to the column, reducing the pressure of the compressed mixture approximately to the pressure in the column, introducing the resulting mixture as feed into the fractionating column, withdrawing nitrogen as overhead from the column, and withdrawing the low-boiling hydrocarbon in substantially pure liquid form from the lower portion of the column, passing overhead nitrogen in heat exchange relation along the upper portion of the column, work expanding the exiting nitrogen and recycling the expanded nitrogen again in heat exchange relation along the upper portion of the column, to provide condensing duty in the column, throttling a portion of the liquid hydrocarbon withdrawn from the column and passing the throttled hydrocarbon in heat exchange relation along the upper portion of the column to provide the balance of the condensing duty required for effecting the separation in the column, passing the exiting vaporized methane and the main portion of the liquid methane withdrawn from the column in heat exchange relation with the compressed feed mixture for cooling same, and compressing the methane product to desired pressure, and passing nitrogen withdrawn from heat exchange relation with the compressed gas mixture for cooling same, the separation of the gas mixture in said column being carried out by nonadiabatic differential distillation and thus increasing the efficiency of the system.

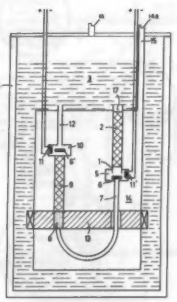


3,589,138

DEVICE FOR TRANSPORTING THERMAL ENERGY FROM A LOWER TO HIGHER TEMPERATURE LEVEL

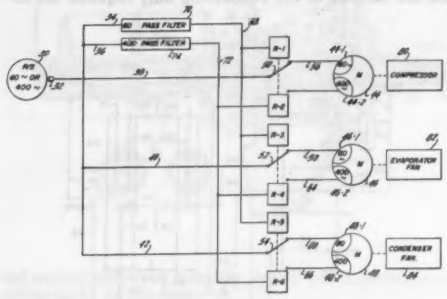
Adrianus Petrus Severijns, and Frans Adrianus Staas, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 3, 1969, Ser. No. 830,068
Claims priority, application Netherlands, June 5, 1968, 6,807,903
Int. Cl. F25d
U.S. Cl. 62—56 **7 Claims**



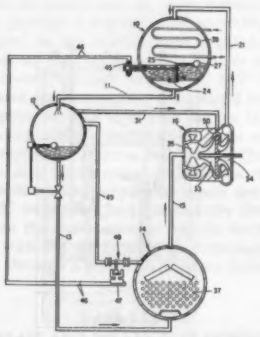
A method and apparatus operating with normal and superfluid ^4He at temperatures below the λ-point of liquid helium, for cooling wherein a first superleak through which passes only superfluid ^4He, produces a fountain-pump effect which is applied to a second superleak which provides cooling an object within a second enclosure.

3,589,139
REFRIGERATED SHIPPING CONTAINER
Reginald L. Arthur, Loveland, Ohio, assignor to Electronic Assistance Corporation, Red Bank, N.J.
Filed Nov. 7, 1969, Ser. No. 874,931
Int. Cl. F25b *1/00, 27/00*
U.S. Cl. 62—115 **7 Claims**



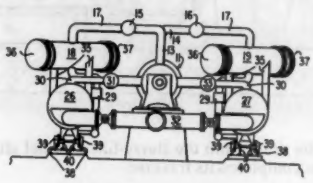
Perishable goods are transported by air by placing them in a portable, insulated container including a refrigerating unit. Electric service is supplied to the refrigerating unit at 60 p.s.i. when the container is at an air terminal at 400 p.s.i. when the container is on board an aircraft. An unskilled attendant can effect the necessary electrical connection by plugging in the refrigerating unit terminal plug to whatever electrical outlet socket is available. The frequency of the supplied electric service is automatically sensed, and an electric signal is generated that depends on the sensed frequency. There is established in the refrigerating unit in response to the electric signal a selected one of two possible configurations such that the operating speed of the refrigerating unit is rendered substantially independent of the frequency of the electric service supplied thereto.

3,589,140
REFRIGERANT FEED CONTROL FOR CENTRIFUGAL REFRIGERATION MACHINES
William T. Osborne, East Syracuse, N.Y., assignor to Carrier Corp., Syracuse, N.Y.
Filed Jan. 5, 1970, Ser. No. 750
Int. Cl. F25b *41/00*
U.S. Cl. 62—197 **4 Claims**



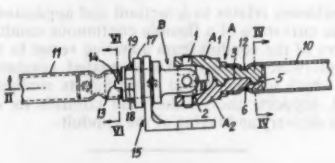
In a refrigeration system including a centrifugal compressor, a condenser, an economizer, and a cooler, there is provided control means to establish a full-flow passage between the condenser and the economizer for transmitting liquid and gaseous refrigerant to the economizer to raise the pressure therein above the pressure in the cooler existing at startup under certain conditions and during certain part load conditions, thereby permitting refrigerant liquid to flow in a normal fashion through the system.

3,589,141
REFRIGERATION APPARATUS
Howard E. Caswell, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 26, 1969, Ser. No. 810,696
Int. Cl. F25d *19/02*
U.S. Cl. 62—448 **1 Claim**



Refrigeration apparatus for supplying chilled water at utility quantities including a refrigerant compressor, a plurality of evaporators and a plurality of condensers. A group of the evaporators are interconnected to form a single-flow path for the water flowing in heat transfer relationship with the refrigerant of the system. Track means will be disposed beneath the evaporator and means will be mounted on the evaporators so the evaporators are movably supported on the track means.

3,589,142
UNIVERSAL JOINTS
Alesandre Lecomte, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France and Automobiles Peugeout, Paris, France
Filed Apr. 21, 1969, Ser. No. 817,925
Claims priority, application France, Apr. 29, 1968, 149,978
Int. Cl. F16d *3/26*
U.S. Cl. 64—17 **1 Claim**

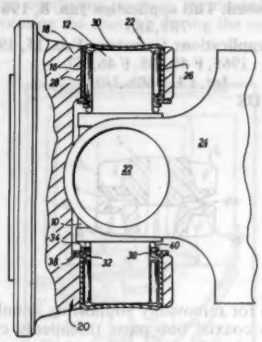


Universal joint of the type comprising a trunnion member formed with opposed trunnions and shanked yokes pivotally mounted on said trunnions, characterized in that at least one of said yokes consists of two half-yokes assembled along a joint plane extending within the yoke shank, with mutually engageable centering elements provided on the joint planes of said half-shanks, and an assembling member surrounding said half-yokes and adapted to hold said half-yokes in their assembled condition.

3,589,143
NEEDLE BEARINGS ESPECIALLY FOR UNIVERSAL JOINTS
Robert S. Batt, Barby Nr. Rugby, England, assignor to The Torrington Company Limited, Coventry, Warwickshire, England
Filed July 22, 1969, Ser. No. 843,572
Claims priority, application Great Britain, July 26, 1968, 35,693/68
Int. Cl. F16c *11/02, 33/58*
U.S. Cl. 64—17 A **9 Claims**

The invention provides a roller bearing having an outer race for mounting in a shaft, housing or similar bore and hav-

ing an external recess or groove at one end of the bearing race to receive an annular washer or equivalent clip extending radially beyond the race, the clip acting to limit displacement of the bearing in one axial direction in the bore.

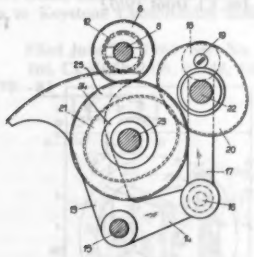


3,589,144

DRIVE SYSTEM FOR CIRCULAR KNITTING MACHINE HAVING A RECIPROCATING OPERATING MODE

Helmut Schlecker, Plochingen, Germany, assignor to Firma Gottlieb Eppinger, Denkendorf, Germany

Filed Nov. 26, 1969, Ser. No. 880,225
Claims priority, application Germany, Dec. 6, 1968, P 18 13 065.9
Int. Cl. D04b *9/00*
U.S. Cl. 66—56 **3 Claims**



A power transmission to provide reciprocating heel and toe motion for a hosiery circular knitting machine, in which the knitting cylinders operate in oscillatory fashion at substantially uniform speed, with rapid acceleration and deceleration upon reversal, which has a gearing mechanism including a pair of nonround gears imparting reciprocatory motion over a connecting rod to a gear segment, the nonround gears being approximately oval and shaped to provide a substantially trapezoidally shaped speed-time of rotation curve characteristic.

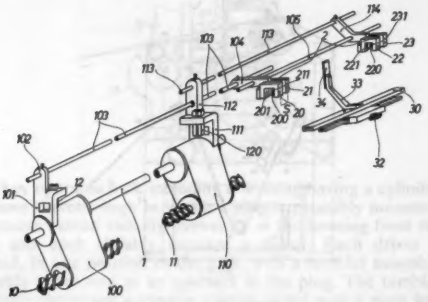
3,589,145

DEVICES FOR AUTOMATIC ADJUSTMENT OF DRAW TRAVEL OF SLUR COCKS IN STRAIGHT BAR KNITTING MACHINES

Werner Koblitz, and Kurt Beitzinger, both of Ingolstadt, Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Nov. 13, 1969, Ser. No. 876,544
Claims priority, application Germany, Nov. 19, 1968, P 18 09 654.3
Int. Cl. D04b *11/06*
U.S. Cl. 66—89 **6 Claims**

Sensing devices, such as photoelectric cells and lights for activating them, are mounted on rods for movement with adjustable yarn guides at opposite edges of a width of material being knit. Such yarn guides are adjustable by shifting nuts along lead screws. Movement of a light barrier relative to the sensing devices is coordinated with the slur cock reciprocation or yarn draw movement. Such barrier cooperates with a sensing device at the end of each slur cock stroke across the width of the material being knit so that, if the relationship between a sensing device and the light barrier at the end of one slur cock stroke changes, a signal will be generated by such sensing device for effecting adjustment of the slur cock travel to produce a new working margin of the material being knit corresponding to the differently adjusted position of the yarn guide and the sensing device connected to it. Drive mechanism for adjusting the length of slur cock stroke is actuated in response to the sensing device signal by a cam rotated in synchronism with the slur cock reciprocating mechanism.

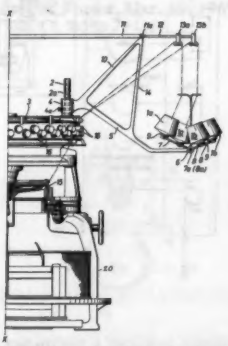


3,589,146

BOBBIN STRUCTURE FOR CIRCULAR KNITTING MACHINES

Richard Schmidt, Stuttgart-Vaihingen, Germany, assignor to Franz Morat G.m.b.H., Stuttgart-Vaihingen, Germany

Filed Mar. 24, 1969, Ser. No. 809,786
Claims priority, application Germany, Mar. 22, 1968, P 17 60 016.7
Int. Cl. D04b *15/40*
U.S. Cl. 66—125 **9 Claims**



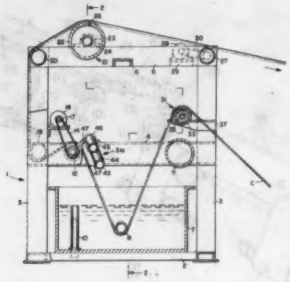
A plurality of angularly adjacent bobbin supporting carrier means are mounted on a circular knitting machine over the station of the operator, and at independently adjustable height so that the bobbins are accessible to tall and short operators.

3,589,147

CARPET SCOURING AND BLOOMING APPARATUS

Herman H. Price, Jr., and George H. Youse, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jan. 22, 1969, Ser. No. 792,990
Int. Cl. D06c *1/00*
U.S. Cl. 68—5 4 Claims



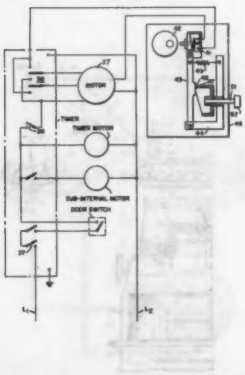
An apparatus for scouring and blooming carpet comprising a convex carpet engaging surface of a fluid-treating member over which the laterally spread carpet is passed endwise and which has a channel in its carpet engaging surface that is connected at spaced points to the bore of the member by ducts through which fluid is delivered to the channel and thus to the carpet. The apparatus is adapted to be used in conjunction with the usual wet-out box of a carpet drying operation and includes carpet washing sprays directed onto the carpet and draining into the wet-out box.

3,589,148

CLOTHES WASHING APPARATUS WITH VARIABLE AGITATION

William A. Wasemann, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1968, Ser. No. 734,927
Int. Cl. D06f *33/02*
U.S. Cl. 68—12 6 Claims



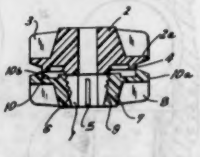
Clothes washing apparatus utilizing agitator structure which is capable of intermittent operation. The subject apparatus is adapted for accommodating various load sizes and types of clothing by providing means for varying the duty cycle of the agitator, a very long duty cycle, for example, corresponding to a very large load of clothes or a heavily soiled load and a very short duty cycle corresponding to a small load of lingerie.

3,589,149

DIVIDED HUB

Artur Fischer, Tumlingen, Kreis Freudenstadt, Germany

Continuation-in-part of application Ser. No. 524,337, Feb. 1, 1966, now abandoned. This application Jan. 8, 1969, Ser. No. 789,883
Claims priority, applications Germany, Feb. 15, 1965, July 8, 1965, F 45,245, F 46,557
Int. Cl. B60b *3/08*
U.S. Cl. 301—63 DS 5 Claims



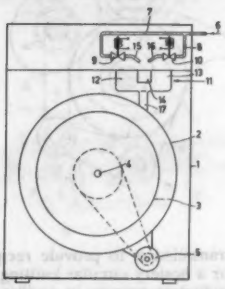
A divided hub for removably supporting annular element has at least two coaxial hub parts threadedly connectable with one another. A pair of disc portions are each provided on one of the hub parts and define with one another a circumferential groove for receiving and retaining an inner marginal zone of an annular element. Means is provided for aligning the disc portions with one another in radial direction of the hub parts when the latter are threadedly connected with one another.

3,589,150

MACHINE FOR WASHING LAUNDRY, DISHES OR THE LIKE

Johannes Hubertus Poletiek, Amiens (Somme), France, and Pieter Hendrik Johannes Brouwer, Groningen, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1969, Ser. No. 816,960
Claims priority, application Netherlands, Apr. 24, 1968, 6805834
Int. Cl. D06f *39/02*
U.S. Cl. 68—17 17 Claims



A domestic washing machine or dish washer having a detergent flushing basin divided into at least three compartments for holding detergents to be fed into the washing area. The detergents are successively flushed into the washing area by water supplied by conduits directed to the various compartments. Two water conduit branches participate in emptying at least one of the compartments.

3,589,151

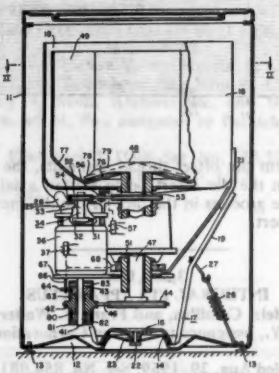
TOP LOADING CLOTHES WASHING MACHINE

Harold F. Gorsuch, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 5, 1969, Ser. No. 830,748
Int. Cl. D06f *21/08*
U.S. Cl. 68—23.7 5 Claims

A top loading clothes washing machine having a spin tub with a vertical wall which is hexagonal in horizontal cross section is disclosed. Agitation and circulation of the water and clothes is effected by means of a conically-shaped im-

peller or agitator structure, which is oscillated by a reversible motor provided therefor. The machine is characterized by utilization of both ends of the motor shaft, one for accomplishing the oscillating motion mentioned above and the other for rotating the spin tub during the centrifuging part of



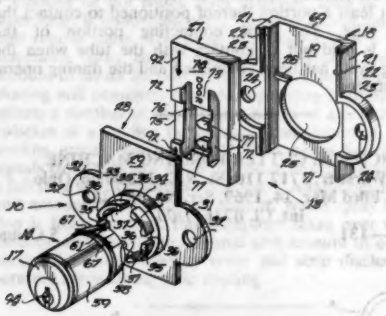
the cycle. Solenoid actuated friction wheel, brake and clutch tab provide for pumping action, restraining the spin tub during washing and disconnection of the impeller drive during spin, all three of these functions being accomplished through the same solenoid and cam actuated timer contacts.

3,589,152

CABINET LOCK ASSEMBLY

Dwight W. Glass, and John L. Orr, both of Rockford, Ill., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed June 30, 1969, Ser. No. 837,559
Int. Cl. E05b *9/06, 65/44;* **E05c** *1/06*
U.S. Cl. 70—81 **10 Claims**



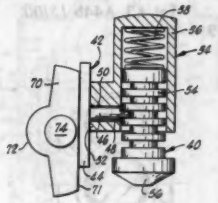
A cabinet lock assembly which may be utilized for a cabinet door, drawer or lid, and when for a door the lock may be used for right- or left-hand application with a back set of either of two different dimensions. The lock assembly includes a bolt guide assembly having a cylinder guide, a bolt guide or housing and a lock bolt, and a cylinder assembly which is snapped into position in the cylinder guide for proper operation and includes a key-operated cylinder lock. The bolt guide assembly is mounted on the rear surface of the door, drawer or lid with the cylinder assembly snapped into the cylinder guide in an upright position, and a simple release and knockout tool will release the cylinder assembly from the rear end of the lock assembly. To adapt the lock assembly for the various installations, the bolt is removed from the housing, flipped over and turned end for end.

3,589,153

KEY OPERATED LOCK

Lewis J. Hill, 4121 N.W. 61st Terrace, Oklahoma City, Okla.

Filed Feb. 16, 1970, Ser. No. 11,668
Int. Cl. E05b *15/14, 27/02*
U.S. Cl. 70—384 **14 Claims**



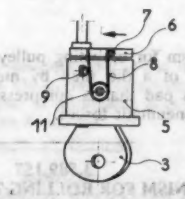
A key operated lock including a housing having a cylindrical bore therethrough in which a plug is rotatably mounted. Apertures extend radially outwardly in the housing from the bore and each slidably receives a driver. Each driver is aligned, in one position of the lock, with a tumbler assembly movably positioned in an aperture in the plug. The tumbler assembly- receiving apertures communicate with a main key slot in the plug, and insertion of a main key in this slot biases the several tumbler assemblies to a lock-opening position in which the tumbler assemblies contact the drivers along a shear line lying in the interface between the plug and body. The tumbler assemblies are adjustable in their dimensions so that they may be altered to permit a new key to be made operative for opening the lock. Each tumbler assembly includes two relatively movable parts which are interlocked by a locking pin until it is desired to alter the assembly's dimension for key changing purposes. The locking pins are cammed to the interlocking positions by cam plates. These cam plates line up with the driver apertures when the plug is rotated to a key changing position, and in this position, a change key can be inserted in a change key slot in the plug to bias each locking pin to a position in which the two relatively movable parts of each tumbler assembly are disengaged. The tumbler assemblies can then automatically accommodate their dimensions to an entirely different main key inserted in the main key slot.

3,589,154

ANTITHEFT LOCK KEY SAFETY LATCHING DEVICES

Paul Lipschutz, Neuilly-sur-Seine, France, assignor to Societe D'Exploitation Des Brevets Neiman, Neuilly-sur-Seine (Hauts de Seine), France

Filed Mar. 10, 1970, Ser. No. 18,181
Claims priority, application France, Mar. 10, 1969, 69/06579
Int. Cl. E05b *11/00*
U.S. Cl. 70—389 **4 Claims**



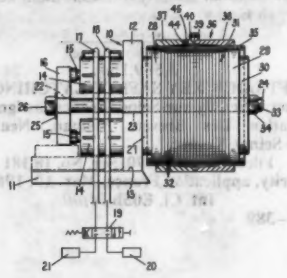
The safety device comprises a resilient member which is pivoted to the fixed body of the lock of an antitheft device, externally thereof each end of the resilient member engaging respectively an abutment element of said fixed body and an abutment element of a rotary cylinder plate of the lock, the expansion of said resilient member causing said cylinder and therefore the antitheft device to be resiliently restored to a position spaced angularly a few degrees from the cylinder position permitting the withdrawal of the key, whereby the

user must compulsorily exert a non-negligible effort for restoring the key and cylinder to the withdrawal position.

3,589,155
KEY HOLDER
Emil W. Kamp, 242 Palm Drive, Hazelwood, Mo.
Filed Mar. 18, 1969, Ser. No. 808,275
Int. Cl. A44b *15/00*
U.S. Cl. 70—459 **8 Claims**

A key holder comprising a key ring formed from a length of resilient wire stock and bent to provide a loop and a pair of leg portions, a discoidal retainer or body formed of plastic, means for mounting a flat, indicia-bearing element on opposite sides of said retainer, means for detachably engaging said key ring leg portions within said retainer between opposed indicia-bearing members and shield components for preventing contact between said leg portions and said indicia-bearing members.

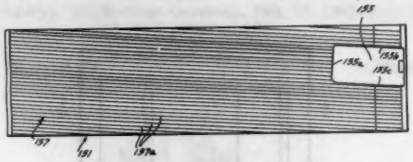
3,589,156
PULLEY CROWNING MECHANISM
Guthrie B. Stone, Honeoye, N.Y., assignor to Stone Conveyor Co., Honeoye, N.Y.
Filed Sept. 30, 1968, Ser. No. 763,723
Int. Cl. B21d *39/08*
U.S. Cl. 72—62 **3 Claims**



A mechanism for crowning pulley blanks to the internal configuration of a die shell by means of an expandable resilient press pad that is compressible by such means as hydraulic or pneumatic forces.

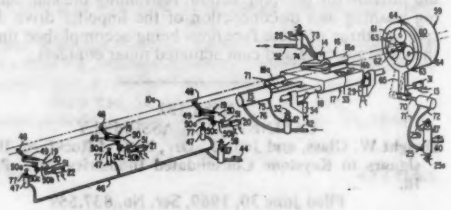
3,589,157
DIE MECHANISM FOR ROLLING THREADS ON SCREW BLANKS
Joseph A. Tabor, Greenwich, Conn., assignor to Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N.Y.
Division of Ser. No. 765,595, Oct. 7, 1968, Pat. No. 3,459,250, which is a continuation-in-part of application Ser. No. 630,887, Apr. 14, 1967. Filed Jan. 31, 1969, Ser. No. 795,405
Int. Cl. B21d *17/00*
U.S. Cl. 72—90 **13 Claims**

Die mechanism for rolling a thread on the shank of a screw blank to form offset thread segments in the screw thread, the faces of a pair of oppositely disposed die members having conventional thread rolling grooves and one of said die members having a die insert in its face, the die insert having



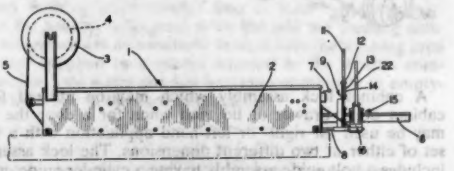
grooves to form the offset thread segments, the bottoms of the grooves in the die insert being shifted axially from the bottoms of the grooves in the face of the die member which has the die insert.

3,589,158
INTEGRAL FIN APPARATUS
Albert J. Kallfelz, Camillus, and Frank F. Walters, Syracuse, both of, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 29, 1969, Ser. No. 854,081
Int. Cl. B21h *3/12*
U.S. Cl. 72—98 **10 Claims**



Apparatus for forming an integrally finned tube having at least one intermediate land, the land being obtained by skip-finning. A mechanism operable to initiate the skip-finning cycle has at least a portion thereof positioned to contact the advancing tube. The tube contacting portion of the mechanism is held out of contact with the tube when the skip-finning cycle has been completed and the finning operation has restarted.

3,589,159
PUNCH FOR GUTTER FORMING MACHINE
Dwaine E. Warstler, 1717 11th St. N.E., Massillon, Ohio
Filed Mar. 14, 1969, Ser. No. 807,282
Int. Cl. B21f *11/00*
U.S. Cl. 72—131 **5 Claims**



A punch for punching holes in sheet metal gutter or eaves trough for attaching downspout thereto. The punch is mounted upon the forward end of a portable gutter forming machine, just beyond the shear or gutter cutter for cutting the formed gutter into desired lengths.

The punch is normally spring-biased to raised position and actuated to lowered position by an eccentric cam. A spring-biased holddown is also actuated by the eccentric cam.

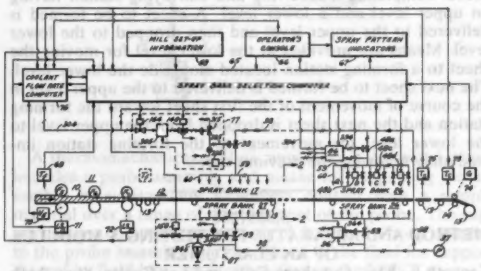
The punch is shaped to form a generally elliptical hole with one substantially flat side to receive a similarly shaped "-drop," or insert, so that either round, elliptical or rectangular cross-sectional shaped downspout may be attached to the gutter thereby.

3,589,160

APPARATUS AND METHOD FOR CONTROLLING ACCELERATED COOLING OF HOT ROLLED STRIP MATERIAL

Luther E. Gruver, Center Valley; Harold A. List, Bethlehem; Rimas A. Zinas, Bethlehem, Pa.; John W. Chang, Newark, Del.; Gary A. Scott, Kintnersville, and William Jeuick, Bethlehem, all of, Pa., assignors to Bethlehem Steel Corporation

Filed June 7, 1968, Ser. No. 735,221
Int. Cl. B21b *27/06, 1/22*
U.S. Cl. 72—201 **30 Claims**



Cooling of hot rolled strip material, such as low carbon steel strip, is controlled while the strip moves along a rolling mill runout table. The table is provided with a plurality of selectable spray banks, each bank applying the same unit amount of liquid coolant from a low pressure source. A time-sharing mill computer receiving operating information signals selects a number of spray banks based on a feed forward calculation of a cooling factor and a calculation of a predicted cooling error term, the latter term being based on stored signals from previous strips cooled. Control means, including a full time special purpose computer, establishes the minimal unit amount of coolant application. When spray bank selection is held constant, this computer takes over the control function and varies the minimal unit amount of coolant proportional to strip velocity error and strip discharging temperature error during strip cooling.

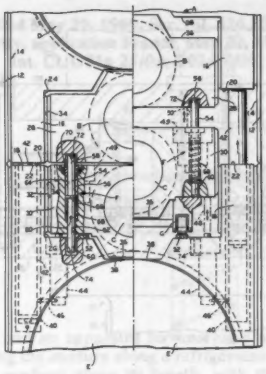
3,589,161

WORK ROLL AUTOMATIC SPACING MEANS

Glenn Paul Moffett, Salem, Ohio, assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed July 22, 1969, Ser. No. 843,646
Int. Cl. B21b *31/08*
U.S. Cl. 72—238 **7 Claims**

An apparatus for automatically causing the work rolls of a rolling mill to be spaced apart during roll changing. The apparatus disclosed comprises vertical plungers in the shape of rods longer in length than the height of the lower work roll chocks which extend through the lower chocks. The plungers are biased upwardly by springs. The upper ends of the plungers protrude well above the lower chocks and remain in contact with the upper chocks during roll separation. The length of the plungers is such that their lower ends automatically recede into the chocks on roll separation permitting a roll carriage to be inserted beneath the chocks. When the chocks are lowered onto the carriage, the plunger lower ends



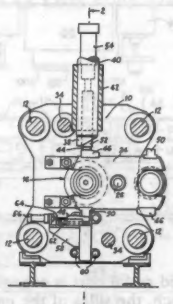
bear against the carriage, and the protruding upper ends hold the upper chocks spared from the lower chocks.

3,589,162

METAL EXTRUSION PRESSES WITH ROTARY DIE-HOLDER CARRIERS

Ernest Lomas, and Peter Singleton, both of Dorset, England, assignors to Loewy Robertson Engineering Company Limited, Bournemouth, England

Filed Dec. 6, 1967, Ser. No. 688,494
Claims priority, application Great Britain, Dec. 9, 1966, 55342/66
Int. Cl. B21c *23/00*
U.S. Cl. 72—263 **3 Claims**



In a metal extrusion press having a rotary die-carrier, stabilizing means for the die carrier, comprising a clamping device consisting of a pair of retractable jaws adapted to engage opposite sides of the die-carrier.

3,589,163

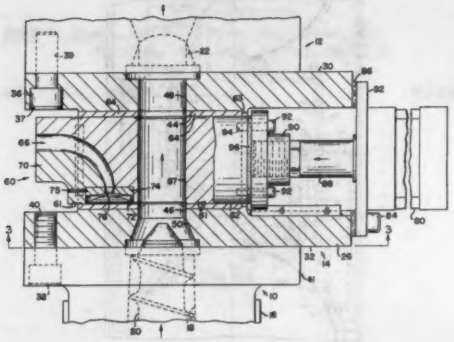
EXTRUSION APPARATUS WITH FLOW DIVERTER

John J. Byrne, Canton, Ohio, and Ignatius J. Niemkiewicz, Wilmington, Del., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Apr. 14, 1969, Ser. No. 815,907
Int. Cl. B21c *33/00*
U.S. Cl. 72—270 **7 Claims**

An extrusion apparatus of the type including a screw-type feeder which supplies material to a die block for extrusion therethrough. The apparatus is provided with a diverting valve assembly between the feeder and the die block. The

valve assembly is arranged to divert flow from the feeder around the die block so that during a die change operation the material flow rates and temperatures are maintained.



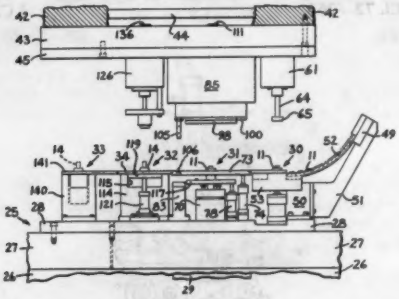
Consequently, following the die change, extrusion can immediately resume without the necessity of waiting while the material is again brought to the proper conditions.

3,589,164

METHOD AND APPARATUS FOR EXTRUDING DOUBLE-ENDED METAL EXTRUSIONS

Orville J. Constant, Hammond, Ind., assignor to Verson Allsteel Press Company, Chicago, Ill.

Filed Mar. 11, 1969, Ser. No. 806,209
Int. Cl. B21d *43/00*
U.S. Cl. 72—354 **20 Claims**



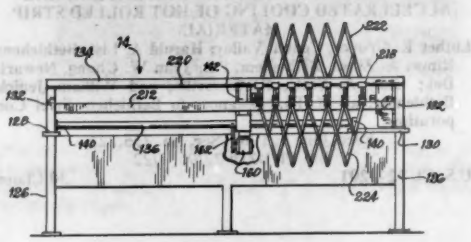
One end of a solid metal part is engaged with the end of a fixed extrusion punch, the sides of the part are encompassed by the cavity of a movable die, the other end of the part is engaged with the end of a movable punch which is also movable with respect to the movable die, and the movable die and the movable punch are moved toward the fixed punch for extruding the part in the cavity in the die to shape the sides of the part and for forwardly extruding the part over the fixed punch and rearwardly extruding the part over the movable punch to shape recesses in the ends of the part. The movable die and the movable punch are carried by the ram of a press and the fixed punch is carried by the bed of the press below the feed level of the press along which the part is fed. As the part is extruded, it and the movable die are moved below the feed level of the press, and when the extrusion of the part is completed, the part is raised to the feed level of the press. Parts to be extruded are supplied to the feed level of the press and fed therealong by feeding means to the aforesaid extruding apparatus, and after the parts are extruded, they are fed along the feed level of the press by the feeding means to a station where the web between the recesses therein is pierced. Thereafter, the feeding means feeds the extruded and pierced parts along the feed level of the press to a point of discharge from the press.

3,589,165

SHEET HANDLING AND FORMING CONSTRUCTION

George W. Lamberson, Oak Brook; Alfred R. Remack, Addison, and Leo R. Gale, Morton Grove, all of, Ill., assignors to The Lockformer Company, Chicago, Ill.

Filed Mar. 12, 1969, Ser. No. 806,411
Int. Cl. B21b *39/20*; B21d *43/00*; B65h *29/00*
U.S. Cl. 72—419 **8 Claims**



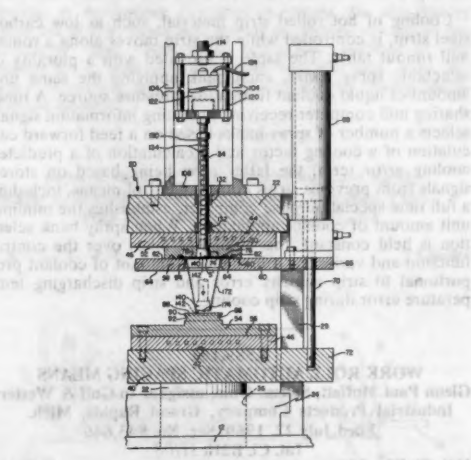
A construction for the handling and forming of metal sheets comprising a receiving and conveying station having an upper level and a lower level. A sheet to be formed is delivered to the upper level and then dropped to the lower level. Means are provided at the lower level for moving the sheet to a forming station located alongside the lower level. The next sheet to be formed is delivered to the upper level in the course of movement of the first sheet toward the forming station and the next sheet is dropped from the upper level to the lower level for movement to the forming station immediately following the previous sheet.

3,589,166

METHOD AND APPARATUS FOR TESTING A MODULUS OF AN ELASTOMER

Kenneth K. Klar, Cuyahoga Falls, and Lee Conley, Stow, both of, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 23, 1969, Ser. No. 818,509
Int. Cl. G01n *3/18*
U.S. Cl. 73—15.6 **12 Claims**



Apparatus for and method of molding and curing a sample of uncured, curable elastomer, such as a tire tread forming material to form a test specimen. A multipart mold is closed to mold and cure the specimen, parts of the mold then being relatively movable to deform the cured specimen. Means for measuring the deformation and the associated force and for displaying and/or recording the deformation force.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the

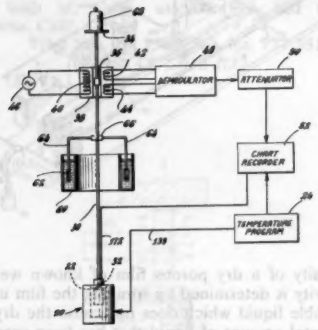
full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,589,167

THERMOMECHANICAL ANALYSIS APPARATUS

Harold I. Hill, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed July 7, 1969, Ser. No. 839,285
Int. Cl. G01n 25/16
U.S. Cl. 73—16 10 Claims



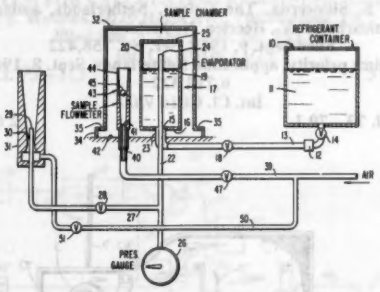
A thermomechanical analysis apparatus is described which includes a probe assembly and means for supporting the assembly in substantially weightless contact with a sample material over a range of displacement of the probe. The support means comprises a reservoir of fluid and a body coupled to the probe assembly and positioned in the fluid for support thereof by fluid-buoyant forces acting on the body.

3,589,168

METHOD AND APPARATUS FOR DETERMINING THE DEW POINT OF GASSES

Paul M. Hankison, McMurray, and Dale B. Sherman, Bridgeville, both of, Pa., assignors to Hankison Corporation, Canonsburg, Pa.

Filed Aug. 15, 1968, Ser. No. 767,555
Int. Cl. G01n 25/02
U.S. Cl. 73—17 10 Claims



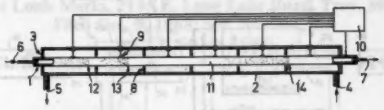
A method of an apparatus for determining the dew point of air or other vapor-containing gas, by placing a container of liquid refrigerant under pressure in a sample of the gas and reducing the temperature of the container surface from a level above the dew point of the gas to a level where condensation commences on the surface by gradually reducing the pressure on the liquid refrigerant and permitting the refrigerant to boil to reduce its temperature, and determining the temperature of the surface when condensation commences by measuring the pressure on the refrigerant within the container.

3,589,169

METHOD AND DEVICE FOR THE ANALYSIS OF GAS

Rene Lafitte, and Paul LeCarpentier, both of Caen (Calvados), France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 20, 1969, Ser. No. 826,223
Claims priority, application France, May 22, 1968, 152778
Int. Cl. G01n 25/04; B01d 7/00
U.S. Cl. 73—23 24 Claims



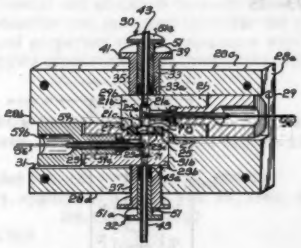
A method and an apparatus for analyzing a gaseous mixture by flowing the mixture along a refrigerated tube having a temperature gradient along its length, with the component gases of the mixture condensing at different axial locations on the tube and means provided for determining the condensing temperature at each location. The temperature gradient is then shifted axially, with the cold end slightly warmed, such that the component which condensed at the lowest temperature is evaporated, carried to a freezer where it is independently recondensed, and finally evaporated to determine its vaporization temperature, leading to an identification of the component gas and its proportion in the mixture.

3,589,170

CHROMATOGRAPH DETECTOR CELL

Julius Praglin, Beachwood, and Gary E. Angeline, Euclid, both of, Ohio, assignors to Keithley Instruments, Inc., Solon, Ohio

Filed Apr. 26, 1968, Ser. No. 724,543
Int. Cl. G01n 31/08, 27/18
U.S. Cl. 73—23.1 13 Claims

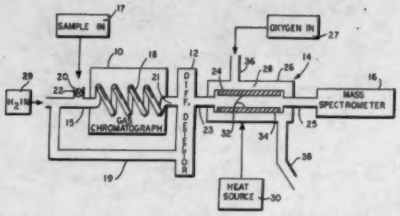


A chromatograph column of compacted adsorbent material is connected to a chromatograph detector cell for detecting the passages of unknowns. The detector cell has temperature sensors disposed in individual members, e.g., block, which have aligned fluid passageways therein for conducting liquid from the column through the cell. A compressible seal member is disposed between the blocks and has an opening through which the liquid flows from one block to the other. The blocks are pressed together to seal against the sealing member. The temperature sensor in each block is sealed to prevent leakage by a compressible sleeve which seals against the sensor and the block when forced inwardly. Inlet and outlet conduits to the cell are constructed from a compressible material and have flanged ends which are sealed against the blocks by conduit couplings threadably inserted into the central bores of the fasteners.

3,589,171
GAS ANALYSIS SYSTEM AND PALLADIUM TUBE SEPARATOR THEREFOR

Floyd C. Haley, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Aug. 25, 1969, Ser. No. 852,825
Int. Cl. G01n *31/08*; B01d *53/22*; H01j *39/34*
U.S. Cl. 73—23.1 19 Claims

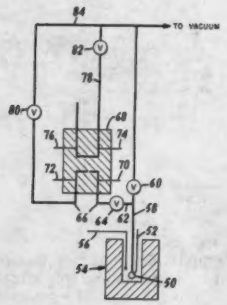


Sequential analytical determination of a vapor sample is performed by suspending the sample in a major amount of hydrogen carrier gas or a mixed carrier gas consisting of hydrogen and helium and passing the suspension through a gas chromatograph. More than 90 percent of the hydrogen carrier gas is removed from the effluent of the chromatograph by passing the effluent through a heated palladium tube before delivering to a detector such as a mass spectrometer. Removal of the hydrogen portion of the carrier gas through the wall of the tube may be enhanced by providing an oxygen containing atmosphere at the outside surface of the tube.

3,589,172
METHOD AND APPARATUS FOR CHARACTERIZING MATERIALS

Robert S. Bowman, Pittsburgh, Pa., assignor to St. Joseph Lead Company, New York, N.Y.

Filed Jan. 12, 1967, Ser. No. 608,743
Int. Cl. G01m *1/00*
U.S. Cl. 73—25 13 Claims

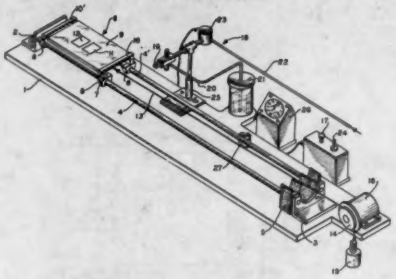


A novel process for characterizing compositions of matter is described in which a sample of the unknown material is heated and the rate of gas evolution from the sample is measured. Comparison of the temperature-gas evolution rates or profiles of the unknown material with the rates or profiles obtained from known materials provides identification of the unknown. Apparatus for carrying out the process is also described.

3,589,173
SYSTEM AND METHOD FOR MEASURING FILM POROSITY

Glen A. Hemstock, Princeton, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Woodbridge, N.J.

Filed May 5, 1969, Ser. No. 821,828
Int. Cl. G01n *15/08*
U.S. Cl. 73—38 3 Claims



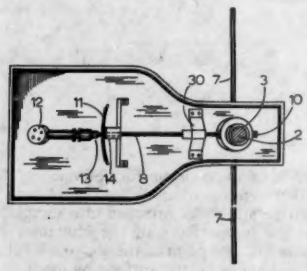
The porosity of a dry porous film of known weight and specific gravity is determined by spraying the film uniformly with a sorbable liquid which does not cause the dry film to swell. The total amount of liquid that has been sprayed and the gloss of the film are periodically measured. The volume of liquid required to effect a sharp increase in the gloss of the film is ascertained and percent porosity is computed using this volume of liquid as representing the volume of voids in the film.

The apparatus used in determining the porosity includes a support with an upper platform for stationing both a thin porous film and a tared receptacle so that they do not overlap. The support is moved in a fixed horizontal path at a constant velocity. A spray is unaware by a switch and applies a ribbonlike spray pattern normal to the path of travel of the support. The spray is started before the support passes thereunder and stopped thereafter. Movement of the support is terminated after it has passed under the spray. The receptacle is removed from the platform and weighed and the gloss of the film is measured. The porosity is then computed.

3,589,174
APPARATUS FOR MEASURING THE DAMPING OF VIBRATIONS IN VISCO-ELASTIC MATERIALS

Bauke S. Sieswerda, The Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed Sept. 9, 1968, Ser. No. 758,422
Claims priority, application Netherlands, Sept. 8, 1967, 6,712,322
Int. Cl. G01d *9/00*
U.S. Cl. 73—70.1 2 Claims



An apparatus is disclosed for measuring the damping of vibrations in visco-elastic materials, such as nonvulcanized,

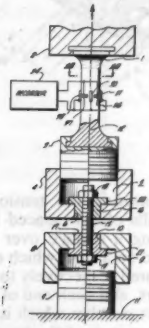
slightly cross-linked rubbers, the apparatus having a moveable arm in communication with the elastic material and carrying a scale attached thereto, the scale having a set of logarithmic graduations in which the interval between each two successive graduation marks is directly proportional to the distance to the zero point. The apparatus is also provided with a counting means for determining the decrease in the number of graduation marks passed in successive vibration periods.

3,589,175

DYNAMIC FATIGUE TESTING

Harold Bock, Los Angeles, and Harold Ernest Elsner, Culver City, both of, Calif., assignors to VSI Corporation, Pasadena, Calif.

Filed Nov. 20, 1968, Ser. No. 777,351
Int. Cl. G01n *3/32*
U.S. Cl. 73—91 17 Claims



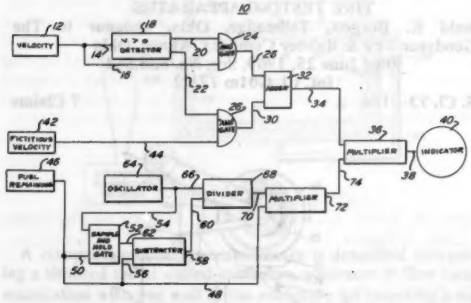
The longitudinal strain and the deflection of a test specimen are monitored and recorded while the load is being applied in a dynamic fatigue test. Strain gauges mounted on a gauge member sense the longitudinal strain and the deflection of the test specimen indirectly. The mounts for the test specimen are designed so specimens can e quickly replaced and adapter sleeves are used so the mounts can accommodate different size test specimens.

3,589,176

SYSTEM FOR CALCULATING REMAINING MILEAGE

James J. Wellons, 6029 Hazel Ave., Philadelphia, Pa.

Filed Feb. 3, 1969, Ser. No. 795,802
Int. Cl. G01m *13/26*
U.S. Cl. 73—113 5 Claims



A system for calculating the remaining mileage available on the remaining fuel of a vehicle comprises circuitry to solve the following equation:

$$MR = V \frac{\text{delta } T}{\text{delta } M} \cdot M$$

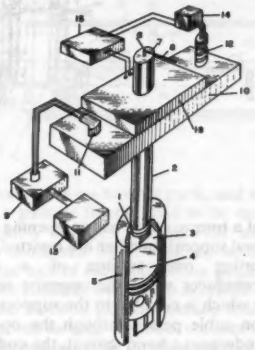
wherein:
MR = miles remaining
V = vehicle velocity in miles per second
delta T = sampling rate in seconds
delta M = the amount of fuel consumed in delta T
M = the amount of fuel remaining

3,589,177

COMBUSTION MICROWAVE DIAGNOSTIC SYSTEM

Angelo Louis Merlo, 2115 E. Long Lake Road, Troy, Mich.

Filed Oct. 2, 1968, Ser. No. 764,566
Int. Cl. G01m *15/00*
U.S. Cl. 73—116 12 Claims



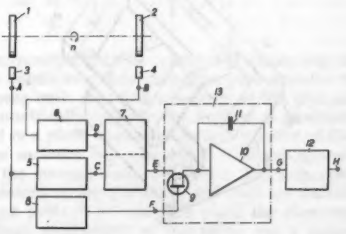
Systems to resonate the combustion chamber of internal combustion engines at radio frequencies, at all available engine r.p.m. are disclosed. Methods, to employ radio frequency resonances for mechanical and electrical measurements within and near the combustion chamber, at all available engine r.p.m., are also disclosed. The system comprises a tunable source of coherent radio frequency energy and a hybrid transmission line to convey the radio frequency energy into the combustion chamber and also to detect the energy reflected from the combustion chamber. The methods, to perform mechanical and electrical measurements within the combustion chamber are ones that correlate the change in the number and properties of the resonances with the continuously changing properties of the combustion chamber.

3,589,178

DEVICE FOR MEASURING TORSION IN A SHAFT

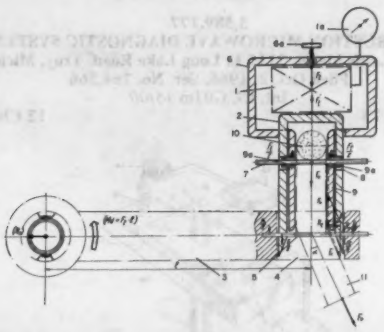
Reimar Germann, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Feb. 18, 1969, Ser. No. 800,080
Claims priority, application Austria, Feb. 19, 1968, A1553/68
Int. Cl. G01 *3/02*
U.S. Cl. 73—136A 3 Claims



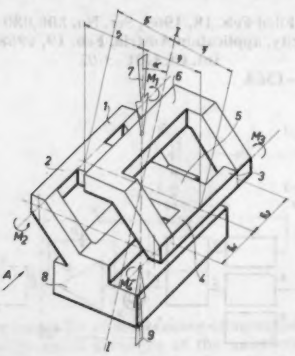
A circuitry for the measurement of the angle of rotating machine elements having two impulse transmitters fixed within range of the rotating machine element and means including circuit connections in order to measure and valuate the information obtained from the rotating machine element.

3,589,179
TORQUE GAUGE FOR DRILLING TONGS
Ioan Nicolau, Cimpina, Romania, assignor to Institutul De Cercetari Si Proiectari Pentru Industria Extractiva De Titei Si Gaze, Cimpina, Romania
Filed Jan. 13, 1969, Ser. No. 790,715
Claims priority, application Romania, Jan. 13, 1968, 55,624
Int. Cl. B25b 23/14; G01l 5/24
U.S. Cl. 73—139 5 Claims



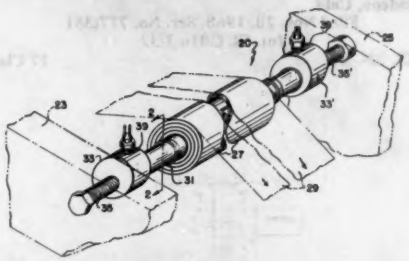
A tong lever of a torque gauge has an opening in which the arms of a U-shaped support member are inserted, the support member supporting one surface of a compression dynamometer transducer while the opposite surface is engaged by a yoke which is coupled to the support member via a bolt. A tension cable passes through the opening in the tong lever and undergoes a bend thereat, the end of the cable being mounted on the bolt. In one embodiment the yoke has arms disposed within the U-shaped support and direct readout of torque is obtained at the transducer irrespective of bend angle whereas in a second embodiment the arms of the yoke are outside the U-shaped support member and the readout of torque is proportional to the bend angle.

3,589,180
TRANSDUCER WITH TORSIONAL SENSORS IN THE FORM OF STRAIN GAUGES
Sandor Kovacs, Budapest, Hungary, assignor to Merestechnikai Kozponti Kutato Laboratorium, Budapest, Hungary
Filed June 30, 1969, Ser. No. 837,516
Claims priority, application Hungary, June 28, 1968, ME-960
Int. Cl. G01l 5/00
U.S. Cl. 73—141 2 Claims



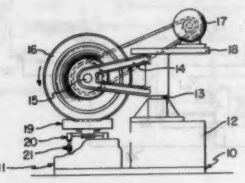
A transducer has torsional sensors for strain gauges, the sensors being in the form of torsional components interconnected by a connecting block and having torsional arms that are interconnected by upper and lower connecting members. The force to be measured is applied to the coupling members and the torsional components subjected to torsion about axes all of which lie in the same plane. The connecting block and the torsional elements are also preferably disposed in this plane.

3,589,181
WEB TENSIOMETER
Roland T. Palmatier, and Robert Clinton Holland, both of Mechanic St., Westerly, R.I.
Filed Sept. 4, 1968, Ser. No. 757,386
Int. Cl. G01l 5/10
U.S. Cl. 73—144 22 Claims



A tensiometer for measuring the tension in a web is mounted between the walls of two spaced frame members and includes a roll, having a surface over which the web moves. The roll is mounted on a shaft which extends between two brackets that are secured respectively to the walls of the two spaced frame members, and each end of the shaft is supported by a lateral support member which is attached to the end of the shaft and to a portion of the bracket. The lateral support members are strained proportionally by a load force resulting from the tension in the web, and strain gauges are located on or in the lateral support members and connected into a bridge circuit to provide a signal indicative of the web tension. The movement of the web over the toll sometimes causes a torque force which increases the strain of one lateral support and decreases the strain of another, thereby distorting the indication of web tension. To eliminate the effect of the torque force, the strain gauges are located on laterally opposite supports and connected into a bridge circuit so that the increased strain sensed by the strain gauges located on one lateral support is offset by the decreased strain sensed by the strain gauges located on the laterally opposite support. Accordingly, an indication of web tension is provided which is not affected by a torque force resulting from the movement of the web over the roll. Additional safety supports are provided at each end of the shaft for engaging and supporting the shaft only upon the failure of the lateral supports.

3,589,182
TIRE TESTING APPARATUS
Donald K. Burgett, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed June 25, 1969, Ser. No. 836,564
Int. Cl. G01m 17/02
U.S. Cl. 73—146 7 Claims

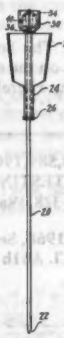


A method and apparatus for continuously measuring the variations in forces exerted by the tread of a rotating tire on

its tread supporting surface, said apparatus containing a substantially planar moving support means whereby a flat footprint is maintained in the rotating tread of a tire while a sensing means continuously detects and measures the variations in the forces exerted by the tread on the support means.

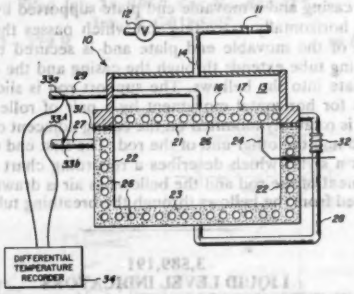
The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,589,183
AIRDROPPED PORTABLE WINDSOCK
Kenneth Ledford, 274 Sunset Ave., Buffalo, Wyo.
Filed July 16, 1969, Ser. No. 842,214
Int. Cl. G01w *1/00*
U.S. Cl. 73—188 **1 Claim**



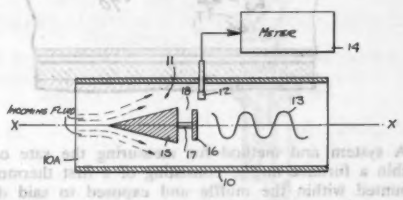
A pointed shaft having a shell and fins slidably mounted about it and supported by a peg at its upper end for guiding the shaft to the ground after being dropped from a plane and for exposing and actuating a spring-loaded windsock.

3,589,184
CONTINUOUS-FLOW GAS CALORIMETER
George E. Moore, Scotia, N.Y., assignor to General Electric Company
Filed Sept. 2, 1969, Ser. No. 854,420
Int. Cl. G01k *17/00*
U.S. Cl. 73—190R **9 Claims**



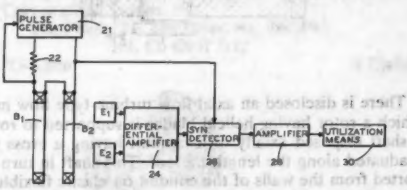
A compact, precise gas calorimeter is described comprising a sintered metal walled enclosure, a plenum in flow communication with one wall of the enclosure for receiving a metered gaseous fuel/air mixture, an igniter located adjacent the inside of the one wall, means embedded within each wall of said enclosure to provide for passage of a metered coolant flow through the interior of each of said walls and means located in the inlet to and outlet from said coolant passage means for determining the differential in temperature between the incoming and outgoing coolant flow. During operation the one wall functions as a plug burner, while the rest of the wall surface of the enclosure serves as condenser area.

3,589,185
VORTEX TYPE FLOWMETER
Thomas H. Burgess, Horsham, Pa., assignor to Fischer & Porter Co., Warminster, Pa.
Filed Sept. 4, 1969, Ser. No. 855,153
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 **5 Claims**



A flowmeter having no moving parts, and including a conduit forming a passage for the fluid to be measured, and an obstacle assembly mounted therein. The assembly is constituted by a contoured block disposed across the conduit, the longitudinal axis of the block being perpendicular to the flow axis of the conduit, and a strip mounted across the conduit behind the block in parallel relation thereto to define a gap which serves to trap Karman vortices created by the presence of the assembly in the flow path. The vortices are sensed to produce a signal whose periodicity is proportional to flow rate.

3,589,186
ELECTROMAGNETIC FLOW METER FOR CONDUCTIVE FLUIDS HAVING MATCHED MAGNETIC AND ELECTRICAL SYSTEMS
Andre Bourg, Chatenay-Malabry, and Philippe Tempe, Cormeilles En Parisis, both of, France, assignors to Societe D'Instrumentation Schlumberger, Paris, France
Filed Dec. 24, 1969, Ser. No. 887,874
Claims priority, application France, Dec. 30, 1968, 181,570
Int. Cl. G01p *5/08*
U.S. Cl. 73—194 EM **16 Claims**

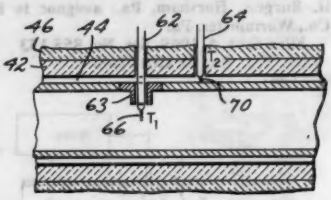


An electromagnetic flow meter for measuring the total flow of a conductive fluid through a pipe includes two current-carrying coils mounted exteriorly of the pipe and positioned diametrically opposite one another to generate a magnetic field in a plane transverse to the direction of fluid flow. The plane includes two electrodes mounted opposite each other on the internal wall of the pipe. The respective shape and dimensions of the electrodes and coils are matched such that at each point in an electrode plane the elemental electrode voltage attributable to that point has a substantially constant value and is a function of the weighting factor of the electrodes and the magnetic field density. In accordance with one embodiment, the electrodes cover a relatively large portion surface of the pipe wall whereas in accordance with another embodiment an array of smaller sized electrodes are utilized.

3,589,187
DRAFT MEASURING DEVICE

Jacob Howard Beck, Waban, Mass., assignor to BTU Engineering Corporation, Waltham, Mass.

Filed May 3, 1968, Ser. No. 726,475
Int. Cl. G01f *1/00*
U.S. Cl. 73—204 9 Claims

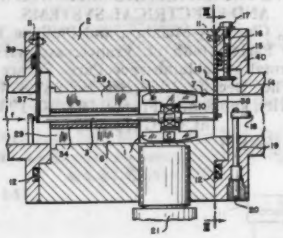


A system and method for measuring the rate of draft within a furnace muffle consisting of a first thermocouple mounted within the muffle and exposed to said draft, a second thermocouple mounted immediately adjacent the muffle but not exposed to said draft, and an indicating device coupled and responsive to the difference between the E.M.F outputs of the two thermocouples.

3,589,188
TURBINE-TYPE FLOW METER

Pierre Belle, Grenoble, Isere, France, assignor to Satam-Societe Anonyme pour Tous Appareillages Mecaniques, Seine-St. Denis, France and Sogreah-Societe Grenobloise d'Etudes et d'Applications Hydrauliques, Grenoble, France

Filed July 31, 1968, Ser. No. 749,015
Claims priority, application France, Aug. 2, 1967, 116,591
Int. Cl. G01f *1/12*
U.S. Cl. 73—230 9 Claims



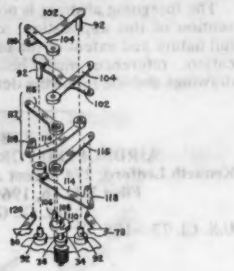
There is disclosed an axial flow turbine-type flow meter in which a rotor having helical blades is supported to rotate on a shaft disposed axially of a conduit having a cross section graduated along the length thereof. This shaft in turn is supported from the walls of the conduit on elastic flexible members which yield under the stress of a flow of fluid through the conduit so that the rotor shifts axially of the conduit through small distances in accordance with the rate of flow of fluid. In order to vary the amount of this shift produced by given rates of flow, means are provided to vary the effective length of at least one of these flexible members.

3,589,189
RECIPROCATING VALVE ACTUATING MECHANISM FOR DIAPHRAGM GAS METERS

Robert R. Douglas, Philadelphia, Pa., assignor to The Singer Company

Filed Aug. 6, 1969, Ser. No. 847,984
Int. Cl. G01f *3/22*
U.S. Cl. 73—268 14 Claims

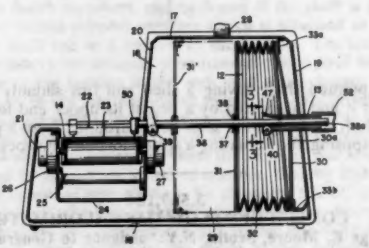
A diaphragm-type gas meter with a plurality of measuring chambers above which is connected on one side thereof a pair of slide valves, operated by a valve-actuating mechanism pivotally connected to a single throw crank in a manner which advances the valve timing to permit greater accuracy at higher volumes of flow. The housing has flat sides and a register is disposed therein on the side opposite the valve and valve-actuating mechanism, whereby a compact gas meter is obtained.



3,589,190
RESPIRATION TESTING APPARATUS

William C. Jones, 16 W. 328 Walnut Lane, Timber Trails, Elmhurst, Ill.

Filed June 21, 1968, Ser. No. 739,000
Int. Cl. A61b *5/08*
U.S. Cl. 73—279 5 Claims



A respiration testing apparatus suitable for use in pulmonary function analysis. The apparatus includes an outer casing and a horizontal bellows which has a fixed end plate secured to the casing and a movable end plate supported by an elongated, horizontally extending rod which passes through the center of the movable end plate and is secured thereto. A breathing tube extends through the casing and the stationary end plate into the bellows. The support rod is slidably supported for horizontal movement by a pair of rollers, one of which is rotatably mounted on the casing adjacent one end of the rod and the other end of the rod. The first end of the rod carries a stylus which describes a recording chart to record movement of the rod and the bellows as air is drawn into and removed from the bellows through the breathing tube.

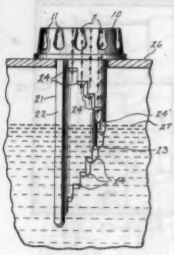
3,589,191
LIQUID LEVEL INDICATORS

Alfred H. Kelch, Jr., Mequon, Wis., assignor to The Kelch Corp., Mequon, Wis.

Filed Oct. 13, 1969, Ser. No. 865,892
Int. Cl. G01f *23/02*
U.S. Cl. 73—327 4 Claims

A reflective gauge device including a transparent, spiral-like depending blade member provided with a plurality of stepped, downwardly facing, prismatic facet elements, said blade extending downwardly into a liquid container and being so designed that light is not reflected through the facets

on that portion of the blade which is immersed in the liquid, there being a calibrated, circular scale in the top of said device whereby the light reflected through the facet element



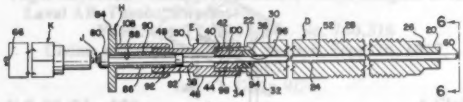
located immediately above the surface of the liquid provides a visual indication on said scale of the volume of liquid present in the container.

3,589,192

ADJUSTABLE THERMOCOUPLE ASSEMBLY

Stephen W. Sabovik, deceased, late of Garfield Heights, Ohio (by Shirley J. Sabovik, executrix), assignor to Alco Standard Corporation

Filed May 27, 1969, Ser. No. 829,161
Int. Cl. G01k 7/04, 13/02
U.S. Cl. 73—344 12 Claims



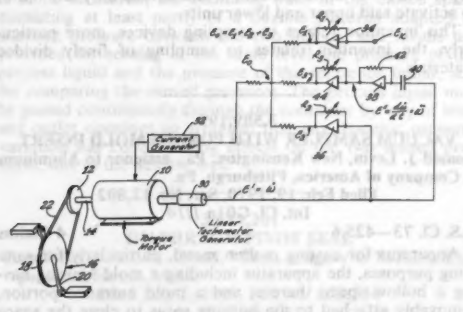
An elongated sheathed thermocouple is received in a bore in a mounting body member. Selective adjustment means is provided between the sheathed thermocouple and the body member to move the thermocouple axially relative to the body member so that the hot junction projects varying distances from the end of the body member. The assembly may be used to obtain temperature of melted plastic at varying depths in a flow conduit.

3,589,193

ERGOMETER

William E. Thornton, 5131 Lancelot Drive, San Antonio, Tex.

Filed July 24, 1969, Ser. No. 844,417
Int. Cl. G01l 5/02
U.S. Cl. 73—379 R 10 Claims



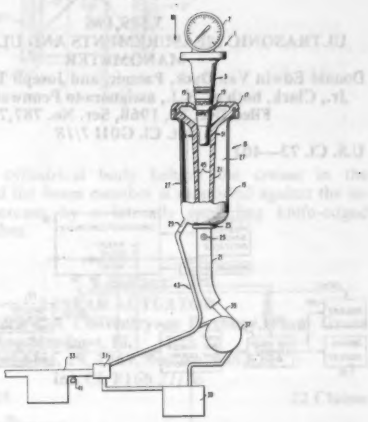
An electrical ergometer capable of imposing measurable work loads on the user's muscles for medical and/or physical therapy purposes. The ergometer includes a torque motor with a plurality of controllable feedback loops for causing the motor to develop different types of easily adjustable forces as it is driven by the user.

3,589,194

TESTING DEVICE AND METHOD

Daniel O. Noorlander, Fresno, Calif., assignor to Milk Producers, Inc., San Antonio, Tex.

Filed Sept. 26, 1969, Ser. No. 861,284
Int. Cl. G01l 7/00
U.S. Cl. 73—389 8 Claims



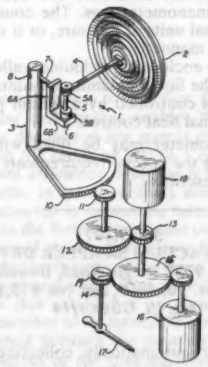
There is disclosed a device and method for testing automatic milking machines and parts thereof for inflation wear, teat message, basic pulsator malfunctions, vacuum instability as the cow milks, and vacuum recovery capacity. The device contemplated is an elongated frustoconical body member having an axially centered bore communicating with a vacuum gauge. A gradually tapering conical surface is provided on the body member with indicia at selected intervals thereon for indicating depth of penetration into a teat cup inflation element and thus the condition of the element and its likelihood to cause injury to the cow.

3,589,195

RUGGEDIZED ROCKING SHAFT

James W. Angus, Baldwin, N.Y., assignor to Kollsman Instrument Corporation, Syosset, N.Y.

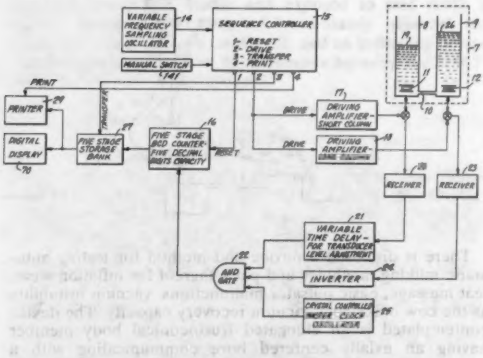
Filed Sept. 25, 1969, Ser. No. 860,906
Int. Cl. G01l 7/12
U.S. Cl. 73—386 4 Claims



A calibration arm assembly for a servo-pneumatic altimeter is connected to avoid degrading torque conditions so that

the original sensing of the pressure actuated mode is maintained. The assembly includes a generally L-shaped support having a base, a vertical arm and crank arm extending transversely between the top portion of the vertical arm and the rocking shaft for locating the support alongside the rocking shaft. The base of the support mounts one end of a bimetallic temperature compensator in nominally parallel relationship with the rocking shaft, the other end of the compensator being pin-connected with a link connected with the altimeter pressure capsule. The support is configured so that the axis of the link is substantially coplanar with the axis of the crank arm to accommodate opposing forces without developing torque about the axis of the crank arm.

3,589,196
ULTRASONIC MEASUREMENTS AND ULTRASONIC MANOMETER
Donald Edwin Van Dyck, Passaic, and Joseph Thomas Weber, Jr., Clark, both of, N.J., assignors to Pennwalt Corporation
Filed Dec. 30, 1968, Ser. No. 787,706
Int. Cl. G01l 7/18
U.S. Cl. 73—401 **22 Claims**



Method and apparatus for measuring the difference in length between two paths through sound-transmitting medium.

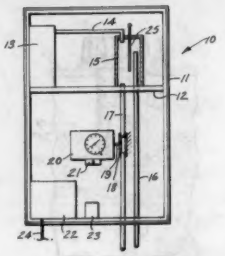
In one embodiment, a U-tube manometer has transducers placed near the bottoms of the columns of liquid in the two manometer legs. An electronic circuit causes the transducers to emit simultaneous sound signals directed toward the tops of the columns. A counter accumulates a count of the pulses produced by a high-frequency oscillator between the time the echo of the sound signal in the short column of liquid is received by its transducer and the time the echo in the long column of liquid is received by its transducer. The count is indicative of the difference in height between the two columns, and thus of the difference between the pressures applied to the two manometer legs. The count may be displayed in conventional units of pressure, or it may be utilized in any other suitable manner.

The manometer is enclosed in a double walled cabinet and the temperature of the liquid columns is maintained constant by a heater which is controlled by a system providing both off-on and proportional heat controls.

The U-tube manometer may be filled with mercury. A transducer satisfying the special requirements due to the use of mercury is also described.

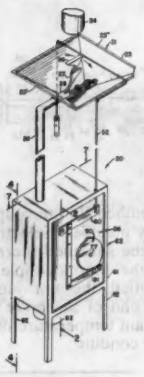
3,589,197
CYCLE VACUUM SAMPLER DEVICE
Fred L. Brooks, Sr., 9727 Bergin Road, Howell, Mich.
Filed Nov. 10, 1969, Ser. No. 875,192
Int. Cl. G01n 1/14
U.S. Cl. 73—421 R **2 Claims**

An apparatus for automatically collecting a sample of water which is to be analyzed, the device including a vacuum pump, a collecting container for the water, and a mechanism that includes a relay operated valve, the relay being activated through a timer device so that a small quantity of water is collected approximately every 20 minutes so that after a 24 hour period a complete water sample for analysis has been



obtained showing characteristics of the water at intermittent times throughout the day.

3,589,198
GRAIN SAMPLING DEVICE
Frank J. Jirik, R.R. #2, Fisher, Minn.
Filed Feb. 14, 1969, Ser. No. 799,350
Int. Cl. G01n 1/20
U.S. Cl. 73—423 **1 Claim**



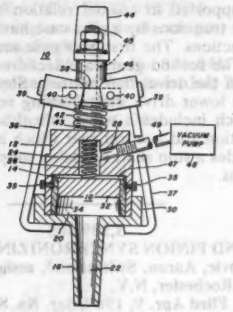
The invention comprises a grain sampling device having an upper and lower unit, with the upper unit sampling grain from a main stream of grain and transmitting it downward to a lower unit, said lower unit further subdividing the grain sample, and depositing the subdivided material equally into two receptacles. A motor is provided for operating said upper and lower units and cam means actuated by said motor to activate said upper and lower units.

This invention relates to sampling devices, more particularly, the invention relates to sampling of finely divided materials.

3,589,199
VACUUM SAMPLER WITH POROUS MOLD INSERT
Donald J. Levin, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Feb. 19, 1970, Ser. No. 12,802
Int. Cl. G01n 1/14
U.S. Cl. 73—425.6 **4 Claims**

Apparatus for casting molten metal, particularly for sampling purposes, the apparatus including a mold housing having a hollow space therein, and a mold entrance portion, removably attached to the housing so as to close the space therein except for an opening in the entrance portion. A porous mold insert is disposed within the housing space, the insert having a cavity therein facing the mold entrance por-

tion for receiving and holding a casting or sample of molten metal therein. A vacuum means is attached to the housing for drawing air from the cavity through the pores of the insert to

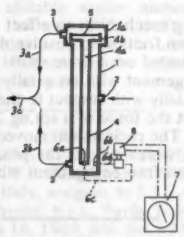


draw molten metal into the cavity when the entrance portion is disposed in fluid communication with a source of molten metal.

3,589,200
APPARATUS FOR MEASURING THE DENSITY OF LIQUIDS

Vilgot Raymond Nilsson, Hagersten, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Sept. 17, 1968, Ser. No. 760,316
Claims priority, application Sweden, Sept. 26, 1967, 13184/67
Int. Cl. G01n *9/26*
U.S. Cl. 73—438 **6 Claims**



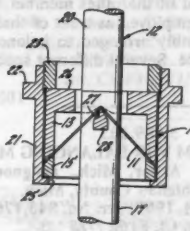
A closed space filled with a reference liquid is arranged within a container for the process liquid of which the density is to be measured, the confining walls of the closed space consisting at least partly of a flexible material adapted to transmit pressure between the two liquids; and means are provided for sensing at the same level the pressure of the process liquid and the pressure of the reference liquid, and for comparing the sensed pressures. The process liquid may be passed continuously through the container by way of inlet and outlet openings so arranged that any dynamic pressure variation has counteracting effects on the two sensed pressures, due to the flexible wall.

3,589,201
DIAPHRAGM PIVOT SEAL

Gerald F. Ostroot, St. Cloud, Minn., assignor to DeZurik Corporation, Sartell, Minn.

Filed July 2, 1969, Ser. No. 838,531
Int. Cl. F16j *15/52*
U.S. Cl. 74—18.1 **9 Claims**

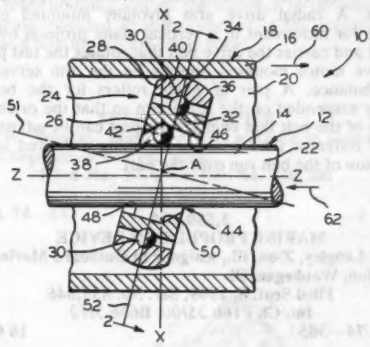
A diaphragm pivot seal is described in which an elliptical sheet material diaphragm is creased on a fold line along its minor axis and joined to a cylindrical body with a beam member protruding through the center of the diaphragm and pivoting at the fold line. In a modification, a support is carried by the cylindrical body behind the crease in the diaphragm and the beam member is supported against the inside of the crease by a laterally extending knife-edged shoulder member.



3,589,202
LINEAR ACTUATOR

Richard B. Stanley, 4 Conventry on Duxbury, Plum Grove Village, Rolling Meadows, Ill.

Filed Mar. 19, 1969, Ser. No. 808,522
Int. Cl. F16h *21/16*
U.S. Cl. 74—25 **22 Claims**

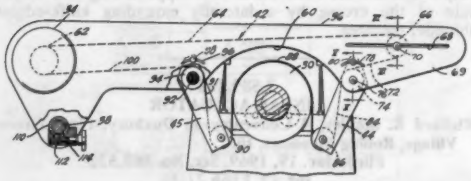


The disclosure pertains to a device for converting rotary motion to linear motion that enables the provision of high force over long distance at low speeds providing a force conversion ratio on the order of 200 to 1 or better operating at 80 to 95 percent efficiency, and that is self-compensating to overcome inertia, in which a shaft member and a tubular member are mounted in concentric telescoping relation, and a bearing unit in the form of inner and outer races and rolling bearings interposed therebetween is wedged between the two in eccentric relation thereto with one of the races serving as a rolling element and being formed with a spherically contoured surface that establishes an elongate rolling contact area with the member to be moved linearly, and a ball wedge lock is established between the member that is rotated and the race that serves as the rotating element of the bearing. The bearing unit is mounted in a fixed plane at an acute angle transversely of the device members and has the axis of rotation of its rotating race lying in the plane that includes the axis of rotation of the rotating member. The position of

the area of rolling contact between the rolling race and the linearly movable member relative to said plane of said axes establishes the pitch of the device, and the bearing unit is spring-biased to maximum pitch position, it being self-compensating to decrease pitch and increase the force conversion factor in overcoming inertia and moving heavy loads.

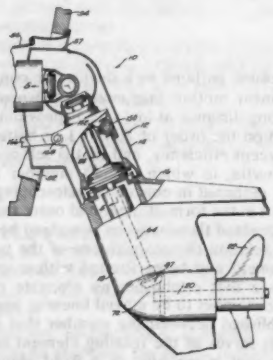
Either the inner or the outer member may be rotated to provide linear movement of the other member, and in practice the bearing unit is employed as a set of three such units forming a bearing assembly arranged to balance the forces acting through the device. Several different specific embodiments are disclosed.

3,589,203
DRIVE MECHANISM FOR BALANCING MACHINE
Gordon E. Hines, Ann Arbor, Mich., assignor to Balance Technology, Inc., Washtenaw County, Mich.
Filed July 28, 1969, Ser. No. 845,176
Int. Cl. F16h *7/18*
U.S. Cl. 74—226 **13 Claims**



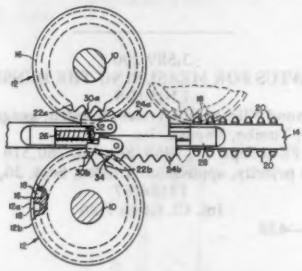
An endless belt drive for a balancing machine of the type wherein a test rotor is carried on horizontally spaced apart bearings. A radial drive arm pivotally mounted on the machine for movement in a vertical plane projects over the test part and carries the drive belt that rotates the test part. A belt drive motor mounted directly on the arm serves as a counterbalance. A pair of guide rollers for the belt are pivotally suspended on the drive arm so that the orientation of a run of the belt that engages the part can be adjusted for parts of different sizes while maintaining a desired vertical orientation of the belt run over the part.

3,589,204
MARINE PROPULSION DEVICE
John A. Langley, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Sept. 8, 1969, Ser. No. 855,846
Int. Cl. F16h *35/00;* **B63h** *5/12*
U.S. Cl. 74—385 **16 Claims**



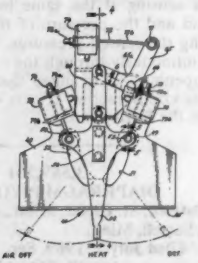
Disclosed herein is a marine propulsion device which includes a drive shaft housing having upper and lower housing sections, and in which the upper housing section is rotatably supported for movement about a horizontal tilt axis by oppositely extending trunnions which are received in inwardly open coaxial apertures in spaced supporting members fixed to the boat hull. Power is transferred from the engine output shaft to a drive shaft by a horizontal cross shaft which is rotatably supported in coaxial relation to the tilt axis and between the trunnions by a gear case having first and second gear case sections. The first gear case section is fixed to the boat hull. The second gear case section is integral with the upper end of the drive shaft housing. Steering is afforded by rotating the lower drive shaft housing section by a steering linkage which includes a worm wheel sector on the lower housing section and a worm gear which is rotated by a drive which includes a stub shaft rotatably supported within one of the trunnions.

3,589,205
RACK AND PINION SYNCHRONIZING MECHANISM
Zeljko Radovic, Aarau, Switzerland, assignor to Sybron Corporation, Rochester, N.Y.
Filed Apr. 9, 1969, Ser. No. 814,541
Claims priority, application Germany, July 11, 1968, P 17 55 926.1
Int. Cl. B61c *11/04;* **F16h** *1/04, 57/00*
U.S. Cl. 74—422 **6 Claims**



A synchronizing mechanism to effect smooth interference free transition from friction to positive drive is accomplished by a gear 22 mounted on a drive shaft 10, which gear 22 is carried into engagement with an axially movable rack 24 to move the rack axially with respect to the positive drive track portion 20 against the force of a spring 26 until the gear and rack are meshed. The rack is then moved by the meshed gear against a stop 28 which orients the positive drive means 16 for smooth friction free engagement with the positive drive portion 20.

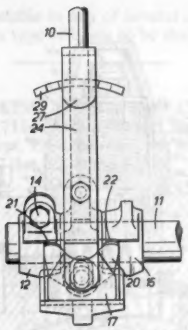
3,589,206
SINGLE KNOB CONTROL DEVICE
Leroy J. Herbon, South Lyon, Mich., assignor to American Motors Corporation, Kenosha, Wis.
Filed Feb. 24, 1970, Ser. No. 13,394
Int. Cl. G05g *9/00*
U.S. Cl. 74—471 **5 Claims**



A single knob control device constructed to provide selective, graduated, control of the air dampers of an automotive

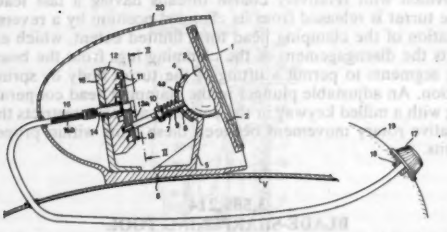
air conditioning system by use of a slotted mounting arrangement and a plurality of pivotally connected, actuating members.

3,589,207
BRAKE ACTUATING SYSTEM
Stanley Walker, Birmingham, England, assignor to Girling Limited, Birmingham, England
Filed June 24, 1969, Ser. No. 836,041
Claims priority, application Great Britain, July 20, 1968, 34,709/68
Int. Cl. G05g 9/00
U.S. Cl. 74—478 3 Claims



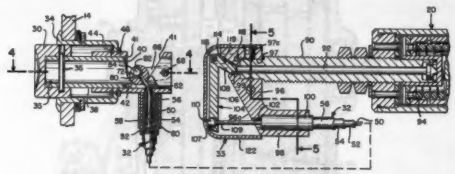
In brake actuating mechanism for applying the brakes on wheels on opposite sides of a vehicle selectively or simultaneously by operation of a single pedal mounted for angular movement on a shaft, the pedal incorporates a housing in which a slipper is slidable under manual control in a direction parallel to the axis of the shaft and a U-shaped abutment member slidably mounted in a slot in the slipper couples the pedal or both sides of the vehicle in accordance with the position of the slipper.

3,589,208
DEVICE FOR REMOTELY CONTROLLING THE SETTING OF A REAR-VIEW MIRROR
Oreste Brero, Turin, Italy, assignor to S.I.L.A. Societa'Industriale Lavorazione Acciai, S.r.l., Turin, Italy
Filed June 16, 1969, Ser. No. 833,479
Claims priority, application Italy, June 19, 1968, 52096A/68
Int. Cl. G05g 1/08, 7/02
U.S. Cl. 74—491 4 Claims



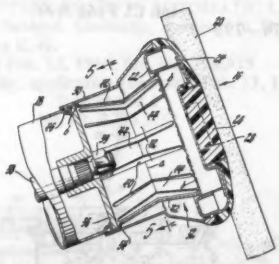
A swivelable external rearview mirror is adjustable by remote control from a driver's position. The mirror has attached thereto a rearwardly extending rod located at its free end in a spiral groove in a fixed plate. The rod can be moved along the groove by a rotatable crank member controlled by the driver, for example by way of a flexible torque transmitting cable, to adjust the angular setting of the mirror.

3,589,209
CABLE OPERATED ACTUATOR ASSEMBLY
Russell B. Howell, Burbank, Calif., assignor to Fairchild Hiller Corporation, Bay Shore, N.Y.
Filed Jan. 2, 1969, Ser. No. 788,450
Int. Cl. F16c 1/10
U.S. Cl. 74—501 8 Claims



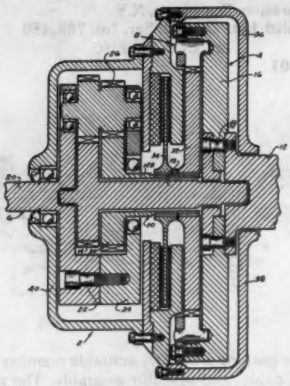
A device for pushing a linearly actuable member comprises a pushbutton, cable, and actuator assembly. The pushbutton is coupled to an end of the cable through a cam and cam follower arrangement such that pushing of the button is converted into a pulling force on the cable by camming a yoke attached to the cable. The other end of the cable is connected to the actuator assembly which pushes the member in response to application of a pulling force from the cable. The actuator assembly includes a pivotally mounted lever having two arms forming an acute angle, with the cable being connected to the end of one arm of the lever and the other arm of the lever abutting against the member to be moved, the lever being mounted so that a portion of the actuator body serves as a fulcrum for the entire lever.

3,589,210
ENERGY ABSORBER
Edwin W. Norman, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 27, 1969, Ser. No. 828,208
Int. Cl. B62d 1/10
U.S. Cl. 74—552 4 Claims



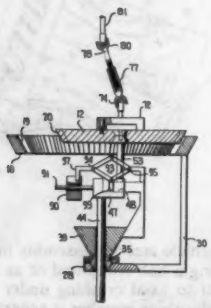
An automotive vehicle steering assembly includes a safety steering wheel having a hub comprised of an energy absorbing member subject to axial crushing under predetermined force. The energy absorbing member is generally tubular and includes a circumferential series of longitudinal strip elements formed with a radially inward prebend to cause the strips to bend further radially inwardly during axial crush of the member, the prebend of each of the strips in the series being selected with respect to its neighbors such that the strips undergo buckling into an orderly overlapping relationship.

3,589,211
AUTOMATIC TRANSMISSION
Kenneth R. Douglas, 3760 Davie Boulevard, Fort Lauderdale, Fla.
Filed July 24, 1969, Ser. No. 844,314
Int. Cl. F16h 5/42
U.S. Cl. 74—752 2 Claims



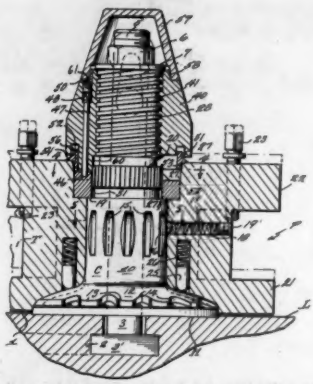
An automatic transmission with an automatically varying input/output ratio over a predetermined operating range having an input shaft, a controlled gear driven at a lower rotational rate than the input shaft, an operating mechanism coupling the input shaft to the controlled gear as a function of input rotational rate, and an output shaft coupled to the controlled gear. The output shaft rotates whenever the velocity of the controlled gear is increased above its lower driven rotational rate by coupling to the faster rotating input shaft. As the force coupling the input shaft to the controlled gear increases, the controlled gear rotates faster, until direct drive is achieved when the controlled gear is rotated at the same rate as the input shaft.

3,589,212
STEPLESS VARIABLE TRANSMISSION WITH VIBRATION DAMPING
Ernst Marcus, Casilla 258, La Paz, Bolivia
Filed Jan. 13, 1969, Ser. No. 790,700
Int. Cl. F16h 3/44
U.S. Cl. 74—793 1 Claim



Gear reduction is achieved between two cooperating inner and outer ring gears, the inner one of which is positioned for eccentric rotation relative to the outer gear, the toothed surfaces of the gears being conically shaped and arranged for relative axial motion with continuous contact therebetween, such that the outer gear presents a variable diameter of meshing surface to the inner gear as the two gears undergo relative axial movement. Vibration resulting from eccentricity of rotation and the mass of the rotating gear or gears, is counteracted by a variably positioned mass arranged to undergo displacement transverse to the system axis according to the degree of eccentricity between the two gears.

3,589,213
TURRET TOOL POST AND HANDLE ASSEMBLY
Eugene F. Gourley, Meadville, Pa., assignor to McCrosky Tool Corporation, Meadville, Pa.
Filed Aug. 16, 1968, Ser. No. 753,235
Int. Cl. B23b 29/28
U.S. Cl. 74—826 8 Claims



A manually indexable turret tool post assembly mounted on a lathe or analogous machine compound by means of a rugged supporting column on which is rotatably mounted a turret body supporting a plurality of tools for selective operation on a workpiece in the lathe. The turret is clamped in one of a plurality of predetermined indexed positions by a rotary clamping head cooperating with a coupling member, each provided with circumferentially spaced projections alternating with recesses. The coupling member, with alternating bearing segments and indentations, is seated within the upper portion of said turret body for relative rotation therewith and is mounted nonrotatably on said column, although it is adapted for incremental radial adjustment thereon. Gradually sloping faces on camming lugs on the rotary clamping head cooperate with similar faces between said indentations and bearing segments to effect a downward movement of the coupling member and turret against the base of the column, and to clamp it in its indexed position by the final rotation of the clamping head on the upper end of the column, which is provided with relatively coarse threads having a fast lead. The turret is released from its clamped position by a reverse rotation of the clamping head for a limited extent, which effects the disengagement of the camming lugs from the bearing segments to permit a lifting of the turret body by spring action. An adjustable plunger in the clamping head cooperating with a milled keyway in the coupling member restricts the relative rotary movement between these units within proper limits.

3,589,214
BLADE-SHARPENING TOOL
Raymond S. W. Lindsay, 4 Sulkara Court, Toronto 16, Ontario, Canada
Filed Feb. 17, 1969, Ser. No. 799,747
Int. Cl. B21k 5/12
U.S. Cl. 76—88 10 Claims

A blade-sharpening tool equipped with a suction-type anchorage on its base and having a rotary blade supporter

and associated blade sharpener supports mounted on the inclined face of the tool body. The support for the sharpening elements is rotatable to any of several operating positions depending upon the type of blade to be sharpened.

3,589,215

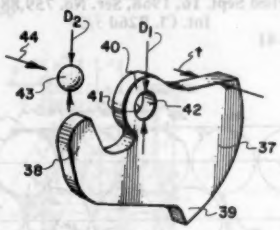
METHOD OF MAKING A CHAIN SAW CUTTING TOOTH

Martin B. Bullard, 7111 Pomelo Drive, Canoga Park, Calif.

Filed Sept. 12, 1969, Ser. No. 857,336

Int. Cl. B23d *63/00*

U.S. Cl. 76—112 **4 Claims**



A chain saw cutting tooth is fabricated by forming a laterally extending retaining hole through a portion of a metal plate and press-fitting a round-shaped carbide object into the retaining hole. After bonding metal has been deposited and hardened in the space defined between the carbide object and plate, sufficient material is removed by grinding for example from the carbide object, plate and bonding metal in order to construct a cutting tip.

The plate may be integrally formed with a depth gauge and a drive tang.

3,589,216

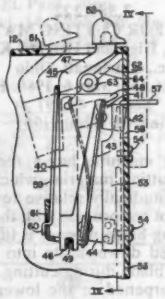
DOMESTIC APPLIANCE

Robert A. Wise, Edison, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1968, Ser. No. 756,637

Int. Cl. B67b *7/24, 7/38;* **B25b**

U.S. Cl. 81—3 **5 Claims**



A device for facilitating the removal of bottle caps and screw-type lids or the like. The device is characterized by the provision of a displaceable striker member which serves to indent the cap or lid upon impacting thereof, thereby releasing such forces which result from the manner in which the closures are installed.

3,589,217

SHAVING MACHINE FOR A CRANK PIN

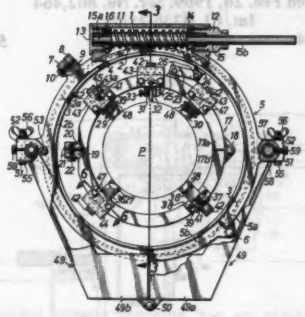
Masaaki Kobayashi, No. 2-5, 1-chome, Kujo-minami, and Tetujiro Kobayashi, No. 30, 3-chome, Ichioka-motomachi, Minato-ku, both of Osaka, Japan

Filed June 16, 1969, Ser. No. 833,374

Claims priority, application Japan, June 20, 1968, 43/43/32

Int. Cl. B23b *5/16*

U.S. Cl. 82—4 B **10 Claims**



A portable shaving machine to rectify distortion and wear and tear of a crank pin and the like comprises a circular casing containing within it a worm rotated by a motor and a worm wheel which engages said worm, a circular rotor arranged in said worm wheel by means of a link and which has a shaving blade and a number of chucks which are arranged to draw the shaving blade to a crank pin, and a supporting frame to fix the casing. It can repair a distorted crank pin very simply without disassembling an engine to remove a deformed crank pin, which is particularly advantageous in case of a crank pin of the engine in a ship.

3,589,218

MEANS TO ACTUATE THE TURNING TOOLS OF ROTATING CUTTER HEADS IN AUTOMATIC LATHES

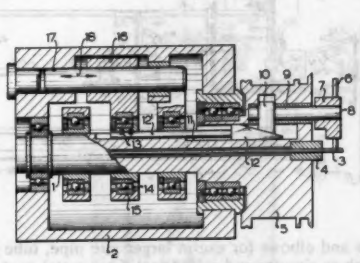
Siegfried Puck, Neviges, Germany, assignor to Hugo Karrenberg & Sohn K.-G.

Filed Feb. 13, 1969, Ser. No. 798,925

Claims priority, application Germany, Feb. 13, 1968, P 16 52 692.4

Int. Cl. B23b *5/12*

U.S. Cl. 82—20 **1 Claim**



An apparatus for actuating the turning tools of an automatic lathe wherein a plurality of independently adjustable,

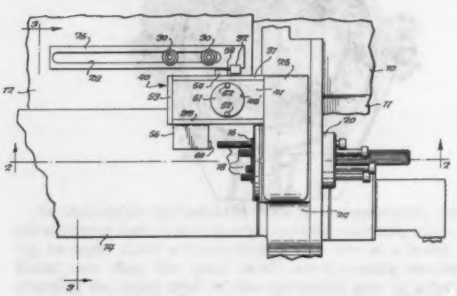
angularly spaced cutting tool holders with associated tools are arranged on a rotatable cutting head disposed on one end of a spindle. Each tool holder has an associated lever which cooperates with an axially moveable pressure key having an inclined surface. Movement of the key actuates each the lever to swing the associated tool holder inwardly whereby each tool may engage a workpiece. Each one of a plurality of axially moveable slide arms transfer force through an associated slide bearing and to push rod. Each push rod engages a pressure key to move the pressure key axially.

3,589,219

STOP MEANS FOR CONTROLLING OF AUTOMATIC MECHANISM

Hubert J. Parsons, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Feb. 26, 1969, Ser. No. 802,464
Int. Cl. B23b *25/06*
U.S. Cl. 82—34 **5 Claims**



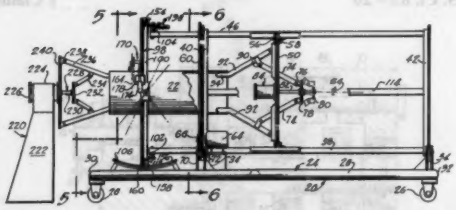
This disclosure is of a stop for an automatic machine tool which is motivated under control of a programming arrangement in which a reduced length of travel of the stop is produced by reversing the direction of movement of the stop with reference to the usual stop screws and in which the usual stop drum is positioned farther forward on the machine for easier setting by the operator and still keep the actual stop at the ideal position with reference to the carriage.

3,589,220

METHOD AND APPARATUS FOR CUTTING ELBOW SECTIONS FROM PIPE

Denver D. Saxon, 4384 Glenwood Parkway, DeKalb County, near Decatur, Ga.

Filed June 10, 1968, Ser. No. 735,903
Int. Cl. B23b *1/00, 3/04, 5/14*
U.S. Cl. 82—47 **6 Claims**



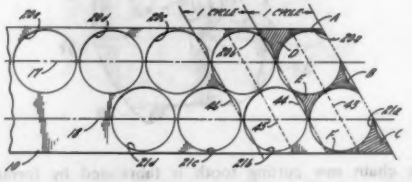
Bends and elbows for use in larger size pipe, tube or conduit, such as circular and cylindrical sheet metal duct, for the purpose of installation normally come in several different stock sizes and angles and may be made from a series of sections or gores. The present method of making a section at a preselected angle is to place the pipe or tube from which the section is to be cut in a jig or fixture in proper alignment for rotation about a constant longitudinal axis, and while the pipe or tubing is rotating bring a cutting blade in cutting contact through the wall of the pipe while sustaining said blade in a movable gimbel or mounting corresponding to the angle desired. One form of the present machine comprises a wheeled base having a pipe or tubing jig thereon comprising adjustable arms which adjust radially from a center with end portions that are inserted inside the end of the tubing to hold same to rotate in alignment about a constant longitudinal centerline. A second jig or fixture may be used on the other end of the pipe if desired. An electric motor-driven circular cutting blade with a carbide edge is mounted in a fixed location on a pivotal frame which supports the blade against the wall of the pipe or conduit being cut and the angle of the support of the cutting blade is adjustable from a gear adjustment means. The pipe jig support is rotatably driven to rotate the pipe by means of a large circular gear which rotates the pipe while the cutting blade is making a cut at the desired angle and the cutting blade pivots to cut at an angle on the circular pipe or tubing.

3,589,221

METHOD FOR CUTTING SCRAP METAL HAVING STAGGERED ROWS OF SUBSTANTIALLY CIRCULAR OPENINGS

James J. Deegan, Clarendon Hills, Ill., assignor to Inland Steel Company, Chicago, Ill.

Filed Sept. 16, 1968, Ser. No. 759,886
Int. Cl. B26d *3/24*
U.S. Cl. 83—41 **9 Claims**



Method for cutting strips or sheets of scrap metal or the like from which substantially circular sections have been removed in a pattern of staggered longitudinal rows to form corresponding rows of openings. The strip or sheet is cut transversely along successive parallel lines with alternate lines passing through the centers of adjacent openings in at least two adjacent rows, and the intervening lines intersecting the longitudinal center lines of the rows of openings in the areas between adjacent openings in each row, so that symmetrical areas of the intersected openings lie on opposite sides of each line in each row. This cutting pattern has the advantage of providing cut scrap which is of relatively uniform size and shaped to provide a high density when the scrap is packed in containers, and a relatively small amount of metal is sheared in each cut.

3,589,222

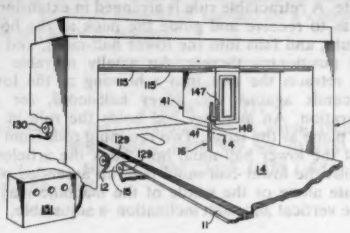
METHOD FOR CUTTING MATERIAL

George W. Sederberg, Highland Heights, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 726,657, May 6, 1968. Filed June 12, 1970, Ser. No. 45,797
Int. Cl. B26d *1/06*
U.S. Cl. 83—49 **14 Claims**

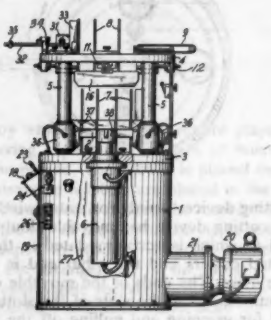
A material cutting machine has a reciprocating cutting blade mounted for cutting material, which is movable both transversely and longitudinally relative to the cutting blade. Means, which does not reciprocate with the cutting blade but moves with the cutting blade when it is lifted upwardly from the material or moved downwardly into the material, provides a guide for the blade during cutting. The cutting blade has its lower end sharpened or the lower end of the guide means sharpened or both are sharpened so that the material is pierced to permit entry of the cutting blade and the guide means into the material. The lower ends of both the guide means and the cutting blade are supported by support means

beneath the material. The support means is rotated simultaneously with the cutting blade so that the support means is



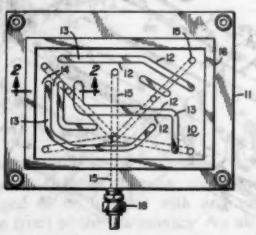
maintained in the desired alignment with the cutting blade when the heading of the cutting blade is changed.

3,589,223
MOTOR-DRIVEN MACHINES, IN PARTICULAR FOR PUNCHING PAPER OR THE LIKE
Walter Schmidt, Karlsbergallee 31, 1000 Berlin 22, Germany
Filed Dec. 17, 1968, Ser. No. 784,349
Claims priority, application Germany, Dec. 19, 1967, P 15 61 514.2
Int. Cl. B26d 7/06
U.S. Cl. 83—90 **5 Claims**



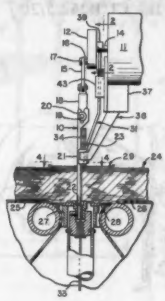
A paper-cutting machine for punching out labels, envelopes and the like in which more than one cutting operation can be carried at one time including: a hydraulically driven slide guided on vertical guide members between a bottom plate and a top plate, and cutting blade arranged between the plates for cutting the paper as desired, the paper then deposited on the top plate where it is removed by an ejector mechanism.

3,589,224
DIE PUNCHING PRINTED CIRCUIT
John J. Frantzen, North St. Paul, Minn., assignor to Buckee-Mears Company, St. Paul, Minn.
Filed Oct. 14, 1968, Ser. No. 767,412
Int. Cl. B26d 7/18
U.S. Cl. 83—100 **5 Claims**



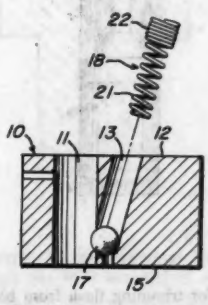
Circuit patterns are formed by punching or stamping them out of a sheet of material with a die punch. The severed sections are then separated by holding one of the sections in place in the die punch with a vacuum. The same apparatus that stamps out the circuits is also used for attaching the punched-out circuit pattern to a supporting layer.

3,589,225
RECIPROCATING FOOT FOR USE WITH MATERIAL CUTTING MACHINE
James G. Wiatt, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio
Filed June 5, 1967, Ser. No. 643,694
Int. Cl. B26d 7/02, 5/42
U.S. Cl. 83—129 **5 Claims**



A material cutting machine has an electric motor for reciprocating a cutting blade to cut material during movement of the cutting blade in both vertical directions. The motor has a crank wheel mounted on its shaft and connected through suitable means to the cutting blade for producing the reciprocating motion. An eccentric, which is mounted on the shaft of the motor, has its center on one side of the longitudinal axis of the shaft and diametrically disposed to the connection of the means to the crank wheel. A follower has one end resiliently biased into engagement with the periphery of the eccentric while its other end is adjustably connected to a flat, circular plate, which is adapted to engage the top of the material being cut by the cutting blade. When the cutting blade is moved upwardly, the plate is moved downwardly into engagement with the material being cut to prevent lifting of the material being cut by the cutting blade during its upward movement. The connection between the follower and the plate is adjustable to accommodate various total thicknesses of the material being cut.

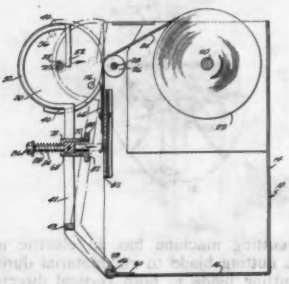
3,589,226
PUNCH ASSEMBLY
Robert L. Shadowens, Jr., West Carrollton, Ohio, assignor to Dayton Progress Corporation, Dayton, Ohio
Filed Nov. 27, 1968, Ser. No. 779,526
Int. Cl. B26f 1/14
U.S. Cl. 83—143 **7 Claims**



A punch, punch retainer or like assembly characterized by a uniquely applied retainer element in the form of a coiled

compression spring installed in a bore to apply a spring load to a component part. The spring has a differential diameter and is differentially wound. When inserted in a bore, a portion of the spring contacts the bore wall with an expanding pressure to per se yieldingly anchor the spring in place. A spring portion lends itself to a simple winding to facilitate introduction and removal of the spring. In certain applications the spring is permitted a self-adjusting action under the influence of impact and vibration forces.

3,589,227
PAPER TOWEL DISPENSER
Nathaniel J. Simpkins, 1815 Bragg St., Chamblee, Ga.
Filed May 5, 1969, Ser. No. 821,696
Int. Cl. B26d *5/20*
U.S. Cl. 83—232 **2 Claims**

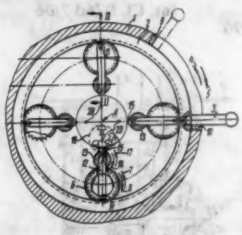


A feeding and cutting mechanism is provided for rolls of paper towels and the like. A single rotation of an operating handle feeds a predetermined length of towel to a cutting device, renders the feeding device inoperative, and then cuts the towel to supply a length thereof to the user.

3,589,228
DEVICE FOR THE INTRODUCTION OF BOTTLES OF PLASTICS MATERIAL INTO A TRIMMING MACHINE OR THE LIKE
Jacques Bourgeois, Lyon, France, assignor to Lesieur-Cotelle, Boulogne sur Seine, France
Filed Aug. 1, 1969, Ser. No. 846,774
Claims priority, application France, Aug. 7, 1968, 50,283
Int. Cl. B26d *7/02*
U.S. Cl. 83—373 **9 Claims**

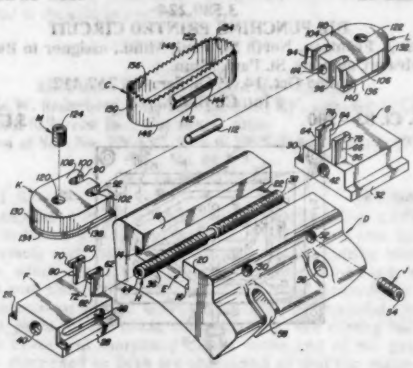
In a machine for trimming flash from blown plastics bottles, the bottle is held during trimming in a two part mold with the flash line coincident with the mold parting line. An inclined chute feeds the bottles into the lower half-mold. One side of the chute has a ledge supporting the bottle necks, so that the flash prevents the bottle from pivoting in its travel down the chute. A retractable rule is arranged in extension of the ledge so as to receive and guide the neck as the bottle leaves the chute, and falls into the lower half-mold, and ensures correct positioning therein. An axially movable rod supports and retracts the rule into a housing as the lower half-mold ascends against the upper half-mold, for the trimming operation. An auxiliary rod holds the rule in the same vertical plane as the ledge, Two retaining rods from the lower edge of the lower half-mold hold back the articles in the chute whilst the lower half-mold is in an ascended position. The chute alone or the whole of the machine may be inclined to the vertical and such inclination is adjustable.

3,589,229
WIRE-CUTTING DEVICE
Alexandr Andreevich Bondarenko, Moskovsky Prospekt, 198/2, Kv.69; Fedor Grigorievich Klevanov, Ulitsa Kotovskogo, 62-a, and Viktor Semenovich Frolov, 1. Novy Pereulok, 12, all of Kharkov, U.S.S.R.
Filed June 18, 1969, Ser. No. 834,394
Int. Cl. B23d *31/00*
U.S. Cl. 83—513 **2 Claims**



A wire-cutting device, mainly for stator-winding machines, wherein the cutting device has movable double-bladed cutters one end of which is accommodated in the slots of the rotating slotted cutters and the other end is connected by pins with the drive. The ends of the movable double-bladed cutters accommodated in the slots of the slotted cutters are hook-shaped for gripping and pulling off the wires and the drive consists of a gear wheel meshing with other gears which latter are connected by pins with the movable double-bladed cutters.

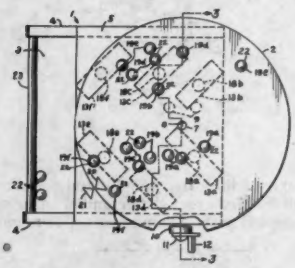
3,589,230
ADJUSTABLE CLAMP FOR KNIVES
Don E. Neuman, Anderson, Ind., assignor to Dovey Manufacturing Company, Anderson, Ind.
Filed June 4, 1969, Ser. No. 830,316
Int. Cl. B26d *1/12*
U.S. Cl. 83—669 **23 Claims**



An adjustable clamp is provided for clamping knives of the type used to cut handholes in cardboard boxes. The clamping

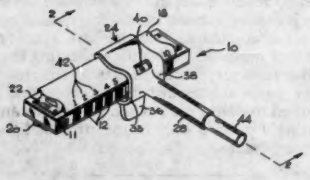
device includes a pair of clamping members connected by adjustment means for moving the clamping members toward and away from one another. The clamping members engage an inner or outer peripheral surface of a cutting knife and clamp the knife in position.

3,589,231
MUSICAL TOY
Carl E. Postel, 2942 Clearview Ave., Canton, Ohio
Filed July 2, 1970, Ser. No. 51,816
Int. Cl. G10d *13/08*; G10f *1/08*
U.S. Cl. 84—102 14 Claims



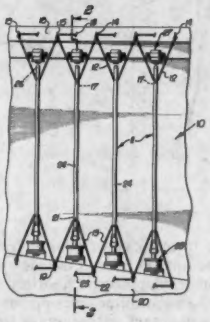
A musical toy which resembles a record player with a rotary record having a particular pattern of holes into which marbles may be placed. The record is placed on the special player mechanism and marbles are placed in the holes in the record. When the record is rotated the marbles drop through guide holes in the top of the player and strike tone plates in a particular sequence to produce different musical tunes depending upon the arrangement of the holes in the record. Different interchangeable records having different hole patterns may be provided with each player unit.

3,589,232
HARMONICA HOLE SELECTOR
Joseph G. Peters, 334 S. Union Ave., Cranford, N.J.
Filed Jan. 17, 1969, Ser. No. 792,019
Int. Cl. G10d *7/12*
U.S. Cl. 84—377 6 Claims



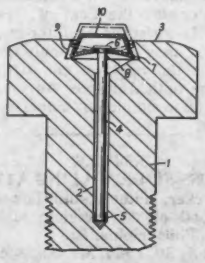
An harmonica hole selector comprising a holder for the harmonica that is slidable thereon and which defines an opening arranged to be aligned with any one of selected openings at the front of the harmonica. An air conduit communicates with the holder opening and extends therefrom a distance at least sufficient to enable a user during use thereof to view the front of the harmonica.

3,589,233
BELL TONE GENERATOR
Paul H. Rowe, Sr., deceased, late of Vista, Calif. (by Paul H. Rowe, Jr., executor, 1825 Alpha Road, Glendale, Calif. 91208)
Filed Oct. 25, 1968, Ser. No. 770,872
Int. Cl. G10d *13/08*
U.S. Cl. 84—402 11 Claims



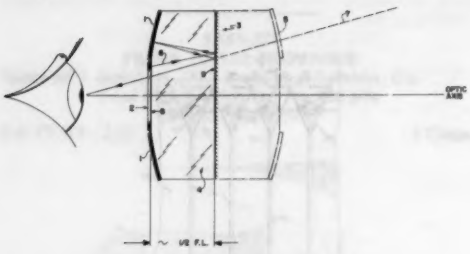
A bent bar generator is tuned to a Flemish standard by drastically changing the frequency of the first subtone so that it is precisely one octave below the prime tone instead of the usual five semitones below the prime tone, all while maintaining the tuning of the first overtone. This is done by deliberately selecting a bar length that is rather substantially sharp whereby severe tuning at selected nodal and antinodal points provides the requisite drastic shift of the relative frequency of the first subtone.

3,589,234
TENSILE MEMBER
Jack Victor Haig Trigg, Queen's Road North Warnboroughs, Odiham, Hampsire, England
Filed May 23, 1969, Ser. No. 827,422
Claims priority, application Great Britain, May 28, 1968, 25497/68
Int. Cl. F16b *31/02*
U.S. Cl. 85—62 6 Claims



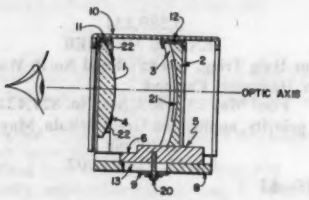
A tensile member has a bore passing through one end, a pin passing through the bore secured at a point along its length to the tensile member and a disc spring connected to the pin and arranged to snap through when the pin is drawn into the bore by a predetermined amount.

3,589,235
COMPACT VIEWFINDER
Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Feb. 7, 1969, Ser. No. 797,555
Int. Cl. G03b *13/04*
U.S. Cl. 88—1.5 **8 Claims**



A virtual image forming viewfinder is compacted by using a mirror to fold the optical path of the viewfinder in half. The reticle and the mirror which forms a virtual image of the reticle are proximate to each other and opposite the folding mirror. The result is a compact virtual image forming viewfinder one-half the thickness of the usual unfolded virtual image forming viewfinders.

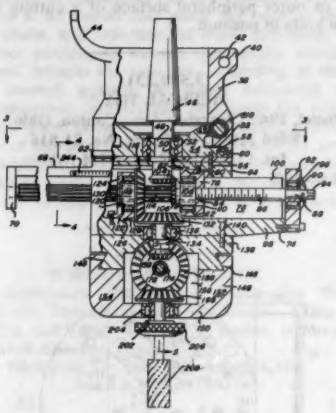
3,589,236
VIEWFINDER HAVING A VARIABLE SIZE FRAME IMAGE
Richard R. Wareham, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Feb. 10, 1969, Ser. No. 798,062
Int. Cl. G03b *13/12, 13/22*
U.S. Cl. 88—1.5 **5 Claims**



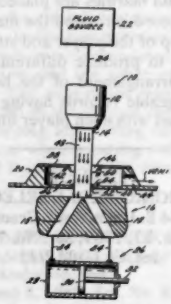
With many optical devices it is not possible for the operator to directly determine the field of view of the optical device he is using. To assist the operator in the proper use of such optical devices, they are commonly fitted with viewfinders through which the operator can sight as a means of properly aiming the optical device. An example of such an arrangement is found in simple box cameras.

3,589,237
DOUBLE CROSS-SLIDE MILLING ATTACHMENT
Manfred E. Strohecker, Hatboro, and Herman C. Voellm, Jr., Meadowbrook, both of, Pa., assignors to Volstro Manufacturing Company, Philadelphia, Pa.
Filed July 30, 1969, Ser. No. 846,097
Int. Cl. B23c *1/12, 7/00*
U.S. Cl. 90—15 **4 Claims**

A milling attachment is disclosed for use with milling machines having a support and a rotary drive spindle associated with the support. The attachment includes a member adapted to be coupled to the support for rotation about an axis defincd by the drive spindle, a first cross-slide member slidably coupled to the rotatable member for sliding movement in a direction perpendicular to the axis of the drive spindle, and a second cross-slide member coupled to the first cross-slide member for sliding in a direction perpendicular to the axis of the drive spindle and the direction of sliding motion of the first cross-slide member. A drive spindle for a cutter is coupled to the second cross-slide member.



3,589,238
VARIABLE GAIN JET PIPE SERVO VALVE
Gerald C. Zoller, Cincinnati, Ohio, assignor to General Electric Company
Filed Feb. 24, 1969, Ser. No. 801,292
Int. Cl. F15b *13/02*
U.S. Cl. 91—3 **5 Claims**

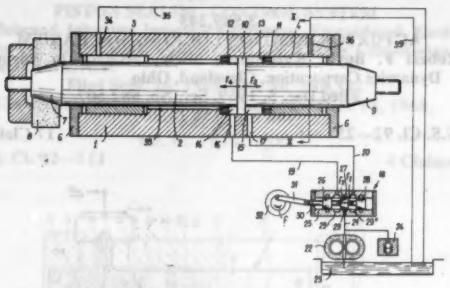


A variable gain jet pipe device is disclosed which comprises a nozzle, receiver means downstream of the nozzle, and pressure recovery varying means interposed between the nozzle and receiver means. The pressure recovery varying means comprises movable means for deflecting the jetstream relative to the receiver, which means is adapted to pass a portion of the jetstream toward the receiver, and a diverter which is adapted to divert part of the passed stream from the receivers during a portion only of the stroke of the pressure recovery varying means.

3,589,239
HYDRODYNAMIC SPINDLE ROTATING AT HIGH SPEED WITH AXIAL RECIPROCATION
Jean Beauchet, Annecy, France, assignor to Societe Nouvelle De Roulements, Annecy, Haute Savoie, France
Filed May 20, 1968, Ser. No. 730,289
Claims priority, application France, May 26, 1967, 108000
Int. Cl. F15b *21/02*
U.S. Cl. 91—35 **5 Claims**

A high-speed hydrodynamic spindle assembly with an axial-reciprocation or tacking movement, in which the spin-

dle comprises, in the vicinity of one of its hydrodynamic bearings, a collar which is displaced between two rings and to which is transmitted the hydraulic pressure of the lubricating



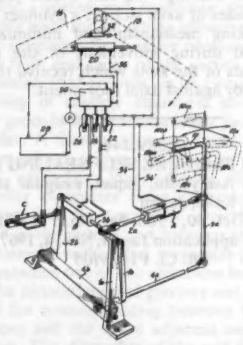
fluid of the bearings, so as to cause the tacking movement of the spindle, the pressure of the fluid and its regulation being obtained by an appropriate distribution device of the lubricating circuit of the bearings of the spindle.

3,589,240

REMOTE CONTROL DIRECTION MECHANISM

Rodrigue Levesque, 28, rue Verbois, Rivere-Du-Loup, Quebec, Canada

Filed June 30, 1969, Ser. No. 837,761
Int. Cl. F15b *13/00*; G05g *9/00*
U.S. Cl. 91—411 8 Claims



A remote control directional mechanism which enables to operate a knuckle boom-type loader along three orthogonal directions from a single operating handle. The boom of the loader will move along directions similar to the ones of the handle moved by an operator. The mechanism per se includes two interconnected angularly deformable quadrilateral arrangements of four arms, each arrangement having a hydraulic cylinder therein, the longitudinal variation of the cylinder permitting the corresponding actuation of the loader.

3,589,241

MINE ROOF SUPPORT SYSTEMS

Douglas H. H. Bolton, and Michael Charles Potts, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Ashchurch, Tewkesbury, England

Continuation of application Ser. No. 678,147, Oct. 9, 1967, now abandoned. This application July 10, 1969, Ser. No. 845,661
Claims priority, applications Great Britain, Oct. 14, 1966, Feb. 28, 1967, 46,030/66 and 9,428/67
Int. Cl. F15b *11/20*, *13/07*
U.S. Cl. 91—411 10 Claims

A mine roof supporting system in which a plurality of roof supports, each having fluid-operated telescopic props, are arranged at intervals along a mineral face and are advanceable, by hydraulic jacks towards a conveyor, in a desired sequence of advancing operation. The advancing operation is carried out through a pair of pilot lines which are alternately interconnected with a fluid pressure source by a two-position con-

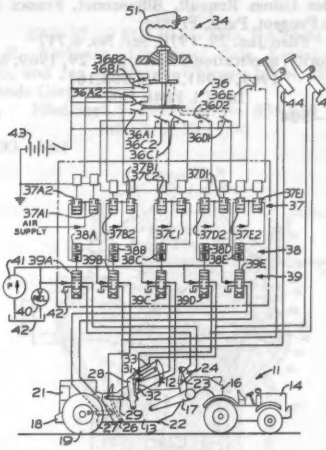
trol valve. One pilot line causes the support to advance, and the other causes it to reset. However, each line is isolated from the supports until the signal in the other line deactuates the isolation means. Therefore, each support will not advance until the next preceding support has been reset.

3,589,242

SINGLE LEVER CONTROL FOR HOEING SCRAPER COMPONENTS

Robert A. Peterson, San Leandro; Roy J. Barnes, Pleasanton, Calif.; Elmer R. Crabb, Morton, Ill., and Donald H. Stroot, Castro Valley, Calif., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 18, 1969, Ser. No. 850,995
Int. Cl. F15b *13/06*, *21/08*
U.S. Cl. 91—413 9 Claims



The earth handling components of a scraper of the kind having a hoeing apron mounted on powered articulated linkage are actuated by means of a single operator's control lever which may be pivoted forwardly, backwardly or to either side and which may be lifted or depressed or rotated in either of two directions, wherein each motion operates a different one of a plurality of electrical switches which control solenoid valves operating fluid jacks coupled to the several scraper components. Ten different scraper component movements may be initiated by appropriate positioning of the single lever, either individually or in certain selected combinations.

3,589,243

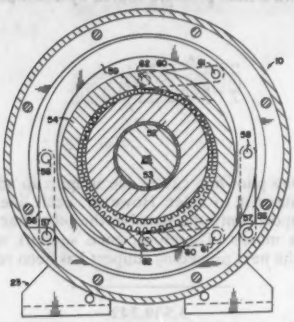
HYDRAULIC DRIVE SYSTEM

Spencer Bowman, 1635 Riverside Drive, Lakewood, Ohio, and Anthony Nevulis, Wickliffe, Ohio, assignor to said Nevulis to said Bowman

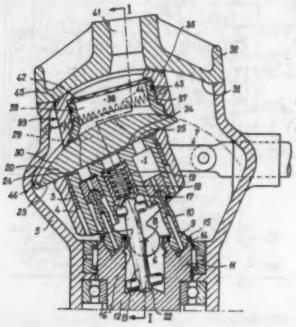
Filed Mar. 17, 1969, Ser. No. 815,251
Int. Cl. F01b *1/06*, *13/06*; F01l *33/02*
U.S. Cl. 91—481 9 Claims

A hydraulic drive wherein a plurality of hydraulically actuated pistons move a ring gear through an orbital path thereby

imparting rotation to an inner gear with which the ring gear meshes. The ring gear is supported for movement by a parallelogram linkage. Valve means driven by the ring gear control the operation of the pistons. The drive system generates a high level of torque even at low speeds and with high volumetric efficiency.

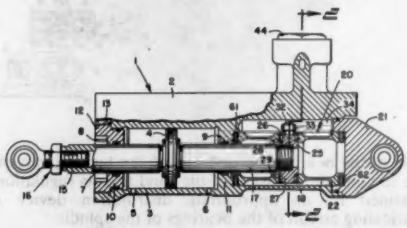


3,589,244
BARREL-TYPE HYDRAULIC MOTORS AND PUMPS
Francois C. Pruvot, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France
Filed Jan. 29, 1970, Ser. No. 6,717
Claims priority, application France, Jan. 29, 1969, Mar. 20, 1969, 6,901,827;6,908,161
Int. Cl. F04b *1/02*
U.S. Cl. 91—504 **9 Claims**



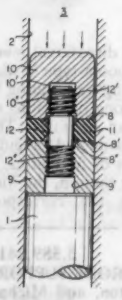
Hydraulic barrel-pump or motor of the variable cylinder capacity type wherein the output can be reversed by moving the cylinder barrel angularly about a pivot axis extending at right angles to the axis of rotation of said barrel, said barrel being formed with a slide-face, the bottom apertures of the cylinders opening into said slide-face, said slide-face being in rotary contact with the distributing slide-face of a distributor plate comprising a curved convex slide-face of a d consisting of a surface of revolution on its face opposite to said distributing slide-face, said distributor plate having formed therein a pair of fluid passages opening each into said distributing slide-face through a port having the shape of one portion of a circular annulus, and on the opposite side, through an orifice formed in said convex slide-face, said barrel revolving in a casing having formed therethrough a pair of inlet and outlet ports opening internally into a curved slide-face which is concave with respect to said pivot axis, said pump or motor being characterized in that an intermediate member formed with a pair of intermediate ducts extending therethrough is adapted to slide between said convex and concave slide-faces about said pivot pin, in such a manner that in all the relative positions of said plate, intermediate member and casing, the aforesaid pair of intermediate ducts connect said fluid passages to said inlet and outlet ports, respectively.

3,589,245
ACTUATOR POSITION LOCKING MECHANISM
Robert F. Boyle, Kalamazoo, Mich., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed Dec. 5, 1969, Ser. No. 882,507
Int. Cl. F15b *15/26*
U.S. Cl. 92—25 **17 Claims**



Actuator position locking mechanism includes a lock piston which is urged in the locking direction by system pressure at a predetermined high level, and in the unlocking direction by such system pressure above such predetermined level, whereby sufficient system pressure is available during both such locking and unlocking movements to counteract external applied forces on the actuator. Projections on the actuator rod have bearings thereon which provide rolling contact with the sides of axial slots in a cylinder or yoke element of the locking mechanism and minimize unlocking forces under load during movement of the rollers from notches in the sides of the slots which receive the rollers for locking the actuator against axial movement.

3,589,246
ULTRAHIGH PRESSURE SELF-SEALING DEVICE
Kazuo Yasunami, Ashiya-shi, Japan, assignor to Kobe Steel Ltd., Fukiai-ku, Kobe, Japan
Filed Oct. 30, 1968, Ser. No. 771,881
Claims priority, application Japan, Nov. 4, 1967, 42/71053
Int. Cl. F16j *9/08*
U.S. Cl. 92—247 **7 Claims**



Apparatus for forming a fluidtight seal between a piston and the walls of the cylinder in which the piston travels. The apparatus is intended for use with ultrahigh pressures in the order of 20,000 atmospheres and comprises a mushroom-shaped pressure receiving member slidably mounted in respect to the cylinder proper. An annular, resiliently deformable, plastic packing member of tetrafluorethylene or the like is interposed between the mushroom-shaped member

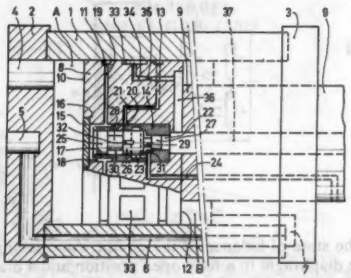
and the cylinder proper and, under the influence of the back pressure which is developed in the cylinder, the packing member deforms to produce the fluidtight seal.

3,589,247

PISTON SEALING CONTROL SYSTEM

Hillebrand Johannes Josephus Kraakman, Emmasingel, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,382
Claims priority, application Netherlands, Sept. 18, 1968, 6813304
Int. Cl. F01b *31/00*
U.S. Cl. 92—111 **4 Claims**



A control system for sealing a hydrostatically journaled working piston against the wall of a cylinder carrying the piston. The cylinder is closed at both ends and the piston is provided with a piston rod extending through one of the closed cylinder ends for supplying effective work. Means are provided for supplying fluid under pressure so that the pressure acts on both end faces of the piston. The piston has a pair of circumferential grooves on its circumferential surface and a plurality of shallow chambers about its surface in between the grooves for hydrostatically journaling the piston in the cylinder. A control element, comprising a piston assembly, is mounted within said piston centrally located therein and extending longitudinally therethrough. The piston assembly comprises three separate piston elements with connecting rods between them, chambers being formed between each of the pistons and between the end pistons and the control element walls. Duct means are provided for communicating between one of the chambers between the pistons and one of the circumferential grooves and other duct means are provided for communicating between the other circumferential groove and the space adjacent one end face of the working piston. The diameters of the end faces of the piston assembly are unequal and having a ratio to each other corresponding to the ratio of surface area of the two end faces of the working piston so that the pressure exerted on both ends of the working piston is the same as the pressure exerted on the corresponding ends of the piston assembly.

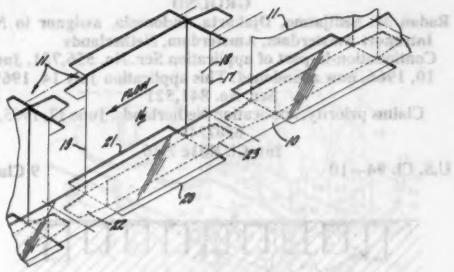
3,589,248

PACKAGING MACHINE WITH CONTINUOUS MOTION SEALER

Robert F. Lense, Rockford, Ill., assignor to Riegel Paper Corporation, New York, N.Y.

Filed June 20, 1969, Ser. No. 835,008
Int. Cl. B31b *1/90*
U.S. Cl. 93—36 **16 Claims**

A continuous motion machine for attaching a sealing strip to the open ends of a series of cartons as the cartons are advanced one-by-one in upright positions along a first path at a high rate of speed. The cartons comprise a pair of opposed end panels, a pair of opposed side panels and sealing flaps hinged to the top and bottom of each panel. Each carton is held on three sides by a U-shaped holder which is movably mounted on a frame, and the cartons are advanced through a sealing station in which the sealing strip is applied to the bottom of the cartons by a sealer. The sealer moves into pressing engagement with the ends of a series of cartons and moves with the latter through the sealing station. Rollers are journaled on the holders and bear against the frame so that the pressure exerted by the sealer is transmitted through the holders and the rollers to the frame. So that the cartons are supported on all sides during sealing, an elongated pressure-



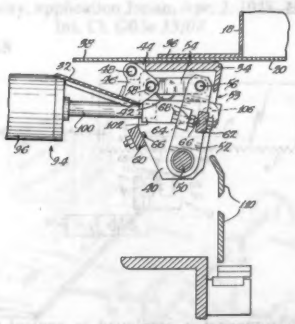
transmitting member is moved into engagement with the holders as the latter move through the sealing station. This pressure-transmitting member extends across the end faces of the legs of each U-shaped holder to close the open side of the U and to transmit a proportional share of the sealing pressure to the rollers on the holders.

3,589,249

END FLAP FOLDING MECHANISM

Stanley R. Norbutas, Glenview; Bela Kertay, Arlington Heights, and Jan Mieleszuk, Chicago, all of, Ill., assignors to Signode Corporation

Filed Sept. 5, 1969, Ser. No. 855,630
Int. Cl. B31b *17/00*
U.S. Cl. 93—55.1 **10 Claims**



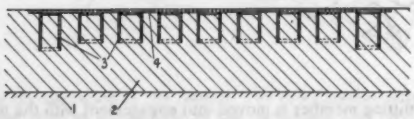
A folding mechanism for folding adjacent flat flanges respectively connected to a container tube and a container end cap and in which the tube flange has a portion spaced from and extending parallel to the surface of the tube. The end cap flange portion has a substantially U-shaped cross-sectional configuration and substantially encompasses the parallel extending portion of the tube flange. The folding mechanism for folding flat flanges to the configuration described includes first and second members adapted to engage space portions of the end cap flange and respectively pivoted about spaced parallel pivot axes. Linkage means interconnect the two members and cooperate with drive means to pivot the first member about its pivot axis from a first substantially side-by-side relation with respect to the second member to an overlapping relation to fold the cap flange around the tube flange. The folding mechanism further includes latch means maintaining the second member in a fixed position until the first member is pivoted to the overlapping position and which is released in response to the second

member moving to the second position to allow pivotal movement of both members about the second pivot axis whereby to further fold the flanges from a position extending perpendicular to the axis of the tube to a position extending substantially parallel to the tube.

3,589,250
REINFORCED CONCRETE SLAB RESTING ON SOFT GROUND

Radan M. Sedijatmo, Djakarta, Indonesia, assignor to N.V. Intraport Amsterdam, Amsterdam, Netherlands

Continuation-in-part of application Ser. No. 556,731, June 10, 1966, now abandoned. This application July 14, 1969, Ser. No. 841,521
Claims priority, application Netherlands, June 17, 1965, 6507747
Int. Cl. E01c *7/10*
U.S. Cl. 94—10 **9 Claims**

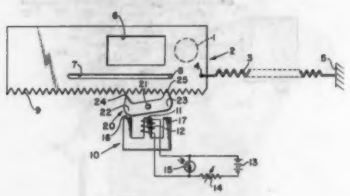


A reinforced concrete slab formed to provide a rugged support when resting on soft soil to form a runway for aircraft or the like, said slab being formed of reinforced concrete and provided with reinforced concrete projections shaped to form pockets for the reception of soil, said projections being resistant to bending and being secured rigidly to the underside of the slab.

3,589,251
SHUTTER SPEED CONTROL

Charles Samuel Webb, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 4, 1968, Ser. No. 765,111
Int. Cl. G03b *7/08, 9/58*
U.S. Cl. 95—10 **5 Claims**



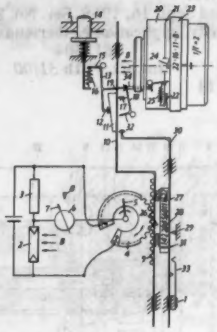
An electromagnet is employed to control the speed of a camera shutter by controlling the force on a pivotal member which engages a portion of the shutter. The field strength of the electromagnet is determined by the light incident on the photoresistive element included in an electrical circuit which determines the current flow through the electromagnet.

3,589,252
PHOTOGRAPHIC CAMERA WITH EXPOSURE-MEASURING DEVICE

Erich Hahn, and Werner Hahn, both of Dresden, Germany, assignors to Veb Pentacon Dresden Kamera-und Kinowerke, Dresden, Germany

Filed Oct. 7, 1968, Ser. No. 765,429
Int. Cl. G03b *7/02, 9/07*
U.S. Cl. 95—10 **5 Claims**

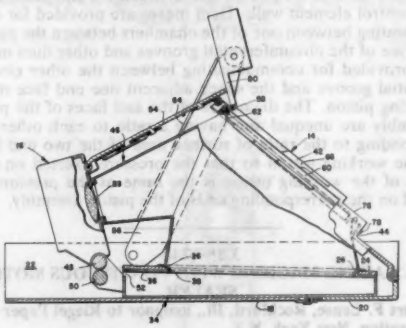
A photographic camera having an interchangeable objective lens and a spring diaphragm having an aperture control is provided with an exposure measuring device enabling exposure measurement to be selectively performed at maximum diaphragm aperture closeable by operation of the shutter release to a measured aperture required for accurate exposure or at a predetermined working aperture as desired. The exposure measuring circuit includes a photoelectric cell influenced by light passing through the objective lens connected in a balancing circuit with adjustable resistive means influenced by the exposure time and film sensitivity controls of the camera and a supply voltage. An indicating means indicates the state of balance of the circuit. An opening means holds the diaphragm in a fully open position and a diaphragm setting means permits closure of the diaphragm to a measured position on actuation of the camera shutter release. A stop-setting member influences the reading of the indicating means and moves a stop which defines at balance the measured aperture. The stop engages the setting means when the shutter release is actuated. A switch means permits the diaphragm to be connected or disconnected from the aperture control to enable measurement to be made at working aperture or at maximum aperture as desired.



3,589,253
FOLDING CAMERA

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 30, 1968, Ser. No. 763,883
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 **29 Claims**



A self-developing camera adapted to be folded into a compact form which is very small relative to the picture size. The camera includes three housing sections pivotally connected to one another for movement between a folded position and an erect position in which the sections define three sides of a light-tight chamber, one section including a lens and shutter, another section including means for locating a photosensitive element in position for exposure, and the third section including a mirror for reflecting light from the lens toward a photosensitive element positioned for exposure; and erecting system including a pair of support members for rigidly retaining the housing sections in the erect position; and means such

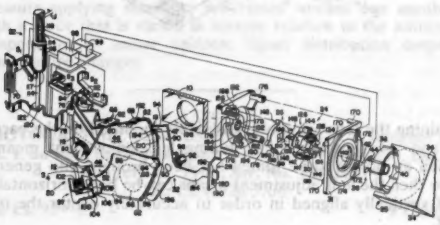
as a viewfinder, a rangefinder, and/or means for supporting a photoflash unit, mounted on the support member for movement between a folded position in which the last-mentioned means are engaged in an external recess and erect position in which these means are operatively oriented with respect to the lens axis.

3,589,254

EXPOSURE CONTROL MECHANISM FOR A PHOTOGRAPHIC CAMERA

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 681,761, Nov. 9, 1967, now abandoned. This application Mar. 26, 1968, Ser. No. 716,051
Int. Cl. G03b *15/03*
U.S. Cl. 95—11 13 Claims



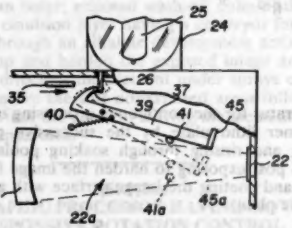
This disclosure involves an exposure control mechanism for a photographic camera which includes means for mounting a multilamp photoflash assembly and means for indexing the assembly in response to operation of the camera shutter to locate successive lamps for ignition during successive photographic exposures.

3,589,255

INDICATOR FOR USE IN PHOTOGRAPHIC APPARATUS TO AUTOMATICALLY SENSE A FLASH LAMP

Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1968, Ser. No. 767,102
Int. Cl. G03b *19/00, 17/18*
U.S. Cl. 95—11 8 Claims



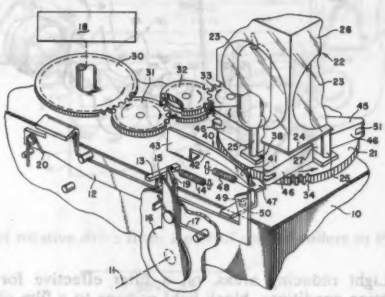
Photographic apparatus, such as a still camera or flash holder, that accepts percussively fired flash lamps and has an indicator for determining whether the lamp in the firing position is good or has been used. The lamps may be incorporated in a multilamp unit, and a signal responsive to the indicator may be electrically or mechanically activated.

3,589,256

PHOTOFLASH IMPACT MECHANISM ENERGIZABLE BY CAM ON LAMP SOCKET

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1968, Ser. No. 767,101
Int. Cl. G03b *15/04*
U.S. Cl. 95—11.5 R 2 Claims



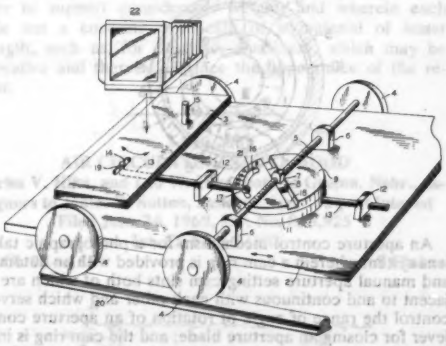
An impact mechanism in a photographic apparatus for successively firing a multilamp photoflash unit is energized by a cam which moves in response to rotation of the unit and the socket in which the unit is detachably retained for indexing movement in the apparatus.

3,589,257

TRACKING OR SCANNING DEVICE

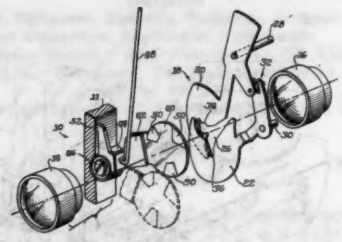
Michio Horiuchi, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed July 10, 1968, Ser. No. 743,762
Claims priority, application Japan, Apr. 2, 1968, 43/21188
Int. Cl. G03s *35/08*
U.S. Cl. 95—18 4 Claims



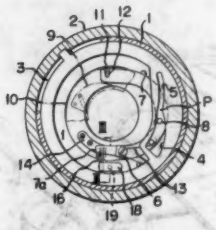
Apparatus for aiming a camera at a center of a subject in order to take a stereoscopic picture. A base is movable along a straight line path and has a plate thereon with a groove in it. A device for controlling the angle of inclination of the groove with respect to the direction of the straight line path is provided and a further device is provided for transmitting the linear motion derived from the rotation of a threaded rod to drive a nut along the groove to a table. The table is pivoted to the base at one end and engaged with the communication device at the other end, and a camera is positioned on the table.

3,589,258
LIGHT CONTROL MEANS IN A CAMERA
Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Nov. 29, 1968, Ser. No. 780,094
Int. Cl. G03b 9/06
U.S. Cl. 95—64 2 Claims



Light reducing areas, on a filter effective for outdoor lighting conditions, block light passage to a film plane from one or more extra-aperture slots generated by an iris when set at an intermediate aperture condition, thereby preventing the image degrading effects caused by light passing through the said slotlike openings.

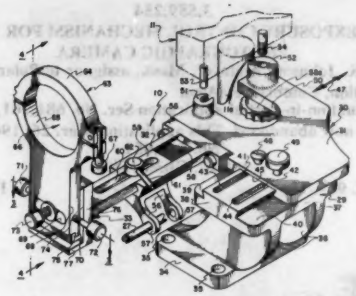
3,589,259
APERTURE CONTROL MECHANISM FOR PHOTOGRAPHIC TAKING LENS SYSTEM
Tadayuki Imai, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Dec. 16, 1968, Ser. No. 783,978
Claims priority, application Japan, Dec. 23, 1967, 42/107801
Int. Cl. G03b 9/06
U.S. Cl. 95—64 1 Claim



An aperture control mechanism for a photographic taking lens system wherein a cam ring is provided with an automatic and manual aperture setting cam slots both of which are adjacent to and continuous with each other and which serve to control the range of angle of rotation of an aperture control lever for closing an aperture blade; and the cam ring is interlocked with an aperture setting ring, whereby automatic and manual aperture index scale regions can be disposed adjacent to each other upon the aperture setting ring.

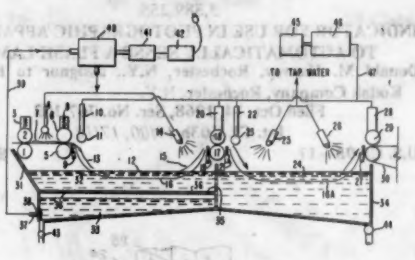
3,589,260
ADJUSTABLE CAMERA MOUNT
Michael Anthony Ferra, 6131 Dalecrest Ave., Woodland Hills, Calif.
Filed Mar. 27, 1969, Ser. No. 810,971
Int. Cl. G03b 17/56
U.S. Cl. 95—86 16 Claims

A camera mount for simultaneously holding a motion picture camera and a lens assembly includes a base attachable to a tripod, a carrier slidably mounted on the base and a lens stabilizer coupled to the carrier. The center of gravity of the camera, lens assembly and mount can be shifted over the tripod to improve balancing by sliding the carrier relative to the base. The lens stabilizer, which includes a cradle for



retaining the lens assembly, is slidably mounted on the carrier and incorporates a fine tuning lens adjustment means. When an object to be filmed has been brought into general view then the lens adjustment means can be both horizontally and vertically aligned in order to accurately center the object.

3,589,261
PHOTOGRAPHIC DEVELOPING APPARATUS
Costas Stylianos Krikelis, Englishtown, N.J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.
Filed Jan. 16, 1968, Ser. No. 698,168
Int. Cl. G03d 3/00
U.S. Cl. 95—89 4 Claims

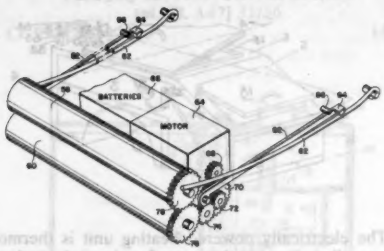


An apparatus for the continuous processing of an exposed photopolymer litho plate by the successive operations of developing and rinsing through soaking pools and sprays, drying and post exposing to harden the image for use, rehumidifying, and coating the image surface with gum arabic to preserve the plate.

3,589,262
PHOTOGRAPHIC PROCESSING APPARATUS
Richard J. Chen, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed June 21, 1968, Ser. No. 738,954
Int. Cl. G03d 9/02
U.S. Cl. 95—89 8 Claims

An apparatus in which a viscous photographic, processing liquid is distributed in a thin layer between an exposed

photosensitive element and another element by moving the elements in superposition through a convergent passage between a pair of juxtaposed pressure-applying members. The viscosity of the liquid varies inversely with temperature.



The speed of movement of the elements is constant while the pressure-applying members are biased toward one another with a force that is varied in inverse relation to the ambient temperature to insure uniform liquid distribution despite temperature changes.

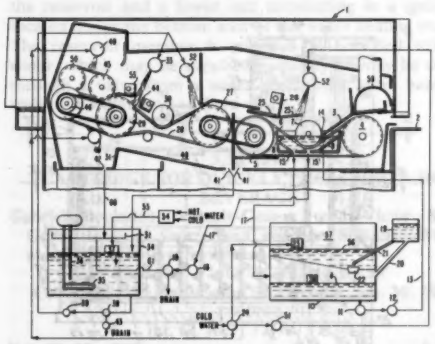
3,589,263

PHOTOGRAPHIC PROCESSING APPARATUS, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 26, 1968, Ser. No. 748,101

Int. Cl. G03d *3/00*

U.S. Cl. 95—89 **9 Claims**



An apparatus for the continuous processing of a film element having an outer, exposed wash-off colloid silver halide photographic emulsion layer having a conveyor for directing the element through an alkaline development activator solution to develop and harden the exposed image areas and a conveyor for directing the element under sprays of washing solution to remove the soft nonexposed areas followed by a light spray to rinse the element leaving the element wet upon exit from the apparatus.

3,589,264

PHOTOGRAPHIC PROCESSOR HAVING MOVEMENT RESPONSIVE ROTATION CONTROL

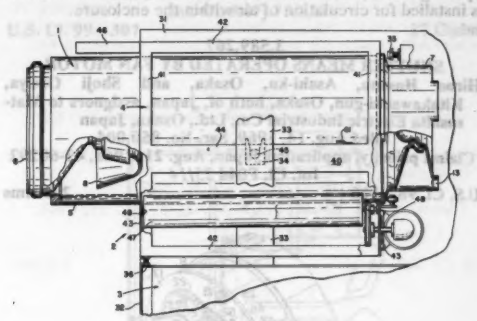
Einar W. Jensen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 18, 1968, Ser. No. 698,833

Int. Cl. G03d *13/04*

U.S. Cl. 95—93 **14 Claims**

A processing apparatus having a tiltable cradle adapted for supporting a tubular processor of the type which is ordinarily filled in one orientation and rotated in another orientation. The cradle is movable between the processor filling and rotating positions and means responsive to cradle movement between these positions are provided for controlling the application of rotative drive from a pair of spaced rollers to the processor.



3,589,265

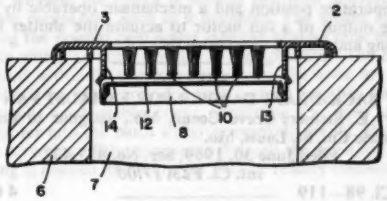
FLOOR REGISTER

Warren R. Hedrick, Holland, Mich., assignor to Allied Thermal Corporation, New Britain, Conn.

Filed June 23, 1969, Ser. No. 835,629

Int. Cl. F24f *13/00*

U.S. Cl. 98—114 **4 Claims**



A floor register wherein the blades are formed of a relatively strong material such as steel, thereby enabling the register to support considerable weight, and wherein each blade has a covering or sheath of a material of lesser strength, such as, for example, aluminum, which may be decorative and thereby enhance the appearance of the register.

3,589,266

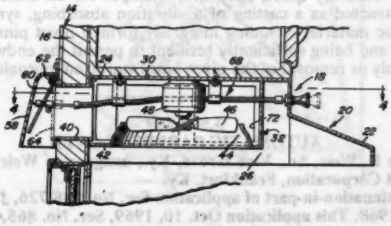
AIR CIRCULATING STOVE HOOD

Charles V. Hike, and Leo W. Hike, both of Gretna, Nebr., assignors to James R. Sutton, Bellevue, Nebr., a part interest

Filed June 24, 1969, Ser. No. 835,925

Int. Cl. F23j *11/00*

U.S. Cl. 98—115 **8 Claims**



A range hood structure including an air intake and an exhaust outlet opening to the exterior of an enclosure in which the hood is installed. The hood structure includes an air

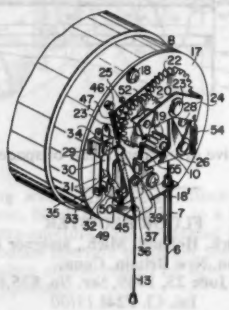
pump for pumping air therethrough and has been modified to include a manually operable exhaust outlet closure baffle as well as a selectively openable supplemental exhaust outlet opening into the interior of the enclosure in which the hood is installed for circulation of air within the enclosure.

3,589,267

SHUTTER MEANS OPERATED BY FAN MOTOR

Hiroo Hosono, Asahi-ku, Osaka, and Shoji Omiya, Kitakawachi-gun, Osaka, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 14, 1969, Ser. No. 850,004
Claims priority, application Japan, Aug. 21, 1968, 43-60292
Int. Cl. F04d *25/14*
U.S. Cl. 98—116 **2 Claims**



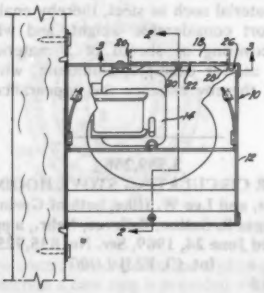
A ventilator having a shutter closed when the ventilator is in inoperative position and a mechanism operable by a part of the output of a fan motor to actuate the shutter for the opening and closing operations thereof.

3,589,268

BACK-DRAFT DAMPER FOR EXHAUST FAN

Robert E. Steiner, Creve Coeur, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed June 30, 1969, Ser. No. 837,427
Int. Cl. F23l *17/00*
U.S. Cl. 98—119 **4 Claims**



A relatively quiet, back draft damper for an exhaust fan constructed as a casting of a vibration absorbing, synthetic, plastic material including integrally formed pivot pins and a stop and being sufficiently resilient to permit the endwise assembly or removal of the pivot pins from fixed journals.

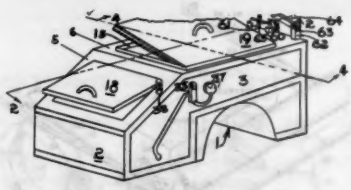
3,589,269

AUTOMATIC BARBECUE OVEN

John E. Weir, Sr., Vine Grove, Ky., assignor to Weir Magic Pit Corporation, Frankfort, Ky.

Continuation-in-part of application Ser. No. 748,726, July 30, 1968. This application Oct. 10, 1969, Ser. No. 865,426
Int. Cl. A23b *1/00*
U.S. Cl. 99—259 **11 Claims**

Discloses a barbecue oven designed for unattended operation through the use of an electrically powered heating unit, and a pyrolytic smoke forming surface, heated by said heating unit and interposed between the barbecuing chamber and the heating coil so as to receive and pyrolyze meat drippings from the barbecue chamber to provide smoke within the



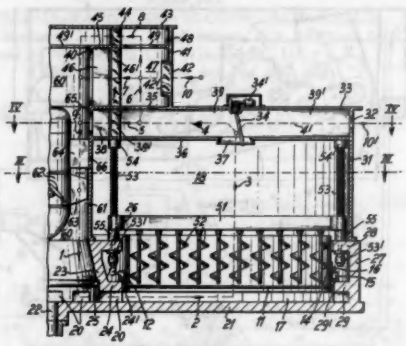
oven. The electrically powered heating unit is thermostatically controlled through the use of a thermal sensing unit within the barbecuing chamber and is timed through the use of a timer so as to cook the meat for a specified time.

3,589,270

DEVICE FOR PREPARING BREWING MALT

Gisbert Schlimme, Braunschweig, and Manfred Tschirner, Wolfenbuttel, both of, Germany, assignors to Miag Muhlenbau Und Industrie GMBH, Braunschweig, Germany

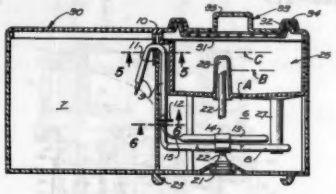
Filed June 12, 1969, Ser. No. 832,588
Claims priority, application Germany, July 10, 1968, P 17 67 997.9
Int. Cl. C12g *3/00*
U.S. Cl. 99—277.2 **10 Claims**



A single apparatus for preparing brewing malt in three steps, namely steeping, germinating and drying. A horizontal rotary annular perforated rack arranged in a cylindrical trough is charged with the material to be treated and while placed on the rotating rack is firstly steeped in water introduced into the trough below the rack. After the water has been discharged, the germinating step is performed by introducing air conveyed by a fan into the space between the rack and the bottom of the trough and upwardly through the material, which latter is turned by a horizontal series of vertically arranged turning worms which as a unit may be horizontally moved into the material on the rotating rack, the unit of worms being vertically movable into the layer of material and again outwardly therefrom.

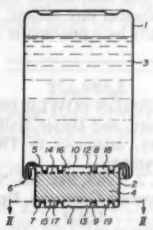
During the final drying step, the same fan is used to circulate heated air through the material on the rotating rack, and the dried material then discharged from the rack by a conveyor which may be lowered into the material on the rack. The material is then discharged into a worm conveyor leading to a discharge pipe. As conveyor may serve an endless conveyor with buckets which scoop the material from the rack.

3,589,271
COFFEE MAKING APPARATUS
James H. Tarrant, Huntington Park, and Arthur L. Stoner, Rolling Hills Estates, both of, Calif., assignors to Western Urn Manufacturing Company, Los Angeles, Calif.
Filed July 25, 1969, Ser. No. 844,759
Int. Cl. A47j *31/56*
U.S. Cl. 99—280 14 Claims



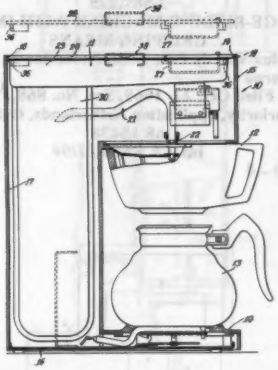
A coffee making apparatus in which a single piece container, molded of plastic material having insulation properties, forms a control chamber and a water heating chamber sharing a common wall, the water heating chamber receiving near its bottom wall a heating coil having extensions projecting to the op of the wall or partition and folded thereover for connection to an electrical source. A thermostat element is conductively connected to the heating coil and provided with a connecting member also folded over the wall. The water heating chamber receives at its upper portion a reservoir member having a depending supply tube terminating adjacent the heating coil to deliver cold water, and a siphon is provided having an upper end located above the bottom of the reservoir and a lower end terminating in a spray head located under the bottom wall of the water heating chamber. The reservoir member is intended to be filled with cold water, which may be supplied manually or may be supplied through a valve from a water supply, the valve being controlled by water level sensors.

3,589,272
CARTRIDGE FOR QUICKLY PREPARING A HOT BEVERAGE
Gabriel Bouladon, Versoix-Geneve, and Victor Spreter, Geneve, both of, Switzerland, assignors to Battelle Memorial Institute, Geneve, Switzerland
Filed Jan. 27, 1970, Ser. No. 6,253
Claims priority, application Switzerland, Jan. 30, 1969, 1409/69.
Int. Cl. A47j *31/14, 31/24*
U.S. Cl. 99—295 6 Claims



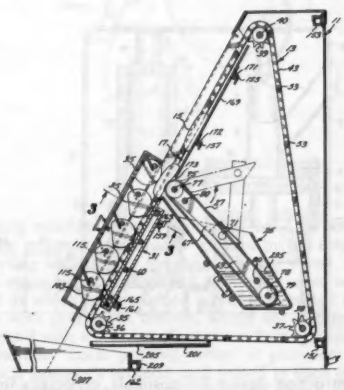
A cartridge for quickly preparing for instance hot coffee by causing water being heated in a first enclosure to burst through a partition into a second enclosure containing ground coffee particles, then though the latter whereupon hot coffee issues through an opening made beforehand in the second enclosure, the coffee particles being held back by a filtering element.

3,589,273
HOT WATER SUPPLY APPARATUS
Harvey R. Karlen, Chicago, Ill., assignor to Cory Corporation
Filed June 11, 1969, Ser. No. 832,239
Int. Cl. A47j *31/057*
U.S. Cl. 99—307 17 Claims



A hot water supply apparatus such as for use in a coffee brewer wherein cold water is poured into the top of the apparatus to displace hot water from a heating tank therein and cause delivery of the displaced hot water to a brewing cartridge wherein the coffee is brewed and then delivered to a suitable receptacle, such as a decanter. The means for conducting the poured cold water into the heating tank includes a basin within an outer housing of the apparatus. The basin is provided with a lid which further closes the open top of the housing. The lid is provided with a duct member having a selectively positionable cover permitting the user to pour cold water into the basin without removing the lid. However, when servicing of the apparatus through the open top of the housing is desired, the entire lid may be readily removed.

3,589,274
CONTINUOUS FEED TOASTER
Robert P. Murray, 7835 4th St., Downey, Calif.
Filed Nov. 28, 1969, Ser. No. 880,824
Int. Cl. A47j *37/08*
U.S. Cl. 99—349 10 Claims



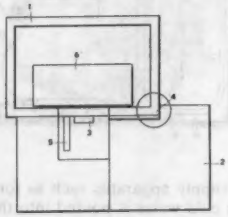
A continuous feed toaster having a housing with a bed formed with an opening across which toastable articles of food are moved by a conveyor. An applicator in the housing

includes a shortening reservoir and an endless belt movable through the reservoir and along the bed opening to pick up and apply shortening to one side of the food articles as they are moved past the opening. A grill in the housing toasts the food articles after they are "buttered" with the shortening. A plurality of eccentrically mounted weights are arranged to sequentially engage and press the foodstuffs against the bed.

3,589,275
PACKAGE-BINDING MACHINE WITH IMPROVED GRIPPING MEANS

Pieter Arnolus Van de Bilt, Zeist, Netherlands, assignor to N. V. Metaverpa

Filed Oct. 22, 1969, Ser. No. 868,370
Claims priority, application Netherlands, Oct. 29, 1968, 68 15438
Int. Cl. B65b *13/04*
U.S. Cl. 100—4 1 Claim

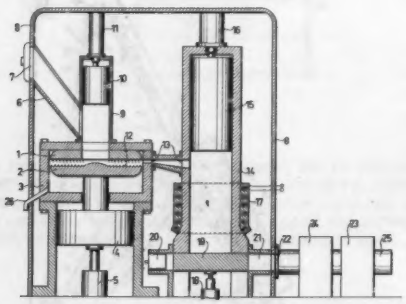


A package-binding machine feeds a loop of binding material about a package and overlaps the ends of the material. A stop limits movement of the free end of the material and causes the stopped material to press against a concave guide surface, thereby closing an air opening which is located in that concave surface. Closing the air opening actuates a fluid cylinder which in turn actuates the gripping mechanism to hold the free end of the material against withdrawal when the loop is tightened about the package.

3,589,276
DESTRUCTION DEVICE FOR HOSPITALS

Sven Arild Swallert, Geneva, Switzerland, assignor to AB Electrolux, Stockholm, Sweden

Filed Nov. 28, 1969, Ser. No. 880,857
Claims priority, application Sweden, Nov. 27, 1968, 16203/68
Int. Cl. B30b *15/34*
U.S. Cl. 100—90 4 Claims

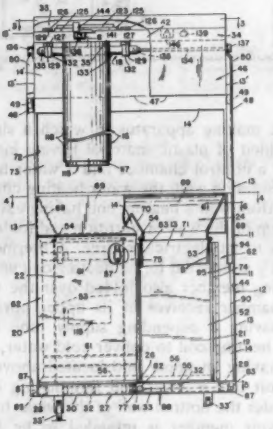


A destruction device for hospitals, especially for destruction of expendable articles made of e.g. glass, plastic material, paper and metal, comprising a grinding device for grinding the articles between mutually rotating discs into small particles, as powder, and passing the powder under the influence of centrifugal force to a device for heat sterilization of said powder and for compressing said sterilized powder to briquettes.

3,589,277
COMPACTOR EQUIPMENT

Waldo H. Gray, Dearborn, and Lyle J. Ritchie, St. Clair Shores, both of, Mich., assignors to Automatic Refuse Systems, Inc., St. Clair Shores, Mich.

Filed Dec. 23, 1968, Ser. No. 786,209
Int. Cl. B30b *15/30*
U.S. Cl. 100—215 19 Claims



The compactor features a vertically reciprocable compacting ram unit shielded externally in its compacting stroke. A bag is supported beneath the ram by a relatively rigid but movable holder; and in one version this holder is a pivoted one. In another embodiment it is a bodily movable, dolly-type. In a dual bag installation, the ram unit shifts between two side-by-side holders as the bag contents are successively compacted. The contents reach the bag through a hopper unit which is vertically shiftable relative to the holder in a rather limited stroke. The ram is pneumatically operated by a vertically acting piston in a fixed cylinder; the hopper is operated up and down by a pneumatically powered cable and pulley arrangement in one adaptation, while in another form it is operated by mechanical link means; and the ram unit is reciprocated horizontally by a pneumatic unit.

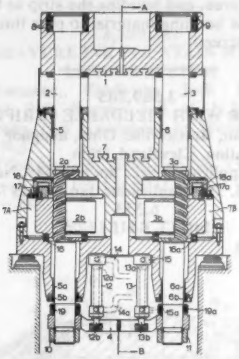
3,589,278
PERCUSSION POWER PRESS

Hans Leichlingen Brauer, and Dieter Hallwass, both of Solingen-Ohligs, Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed Dec. 2, 1969, Ser. No. 881,392
Claims priority, application Germany, Dec. 3, 1968, P 18 12 328.9
Int. Cl. B30b *1/34, 15/16*
U.S. Cl. 100—271 10 Claims

A percussion power press wherein the base guides two vertically reciprocable columns of a frame whose upper crosshead carries the punch and whose lower crosshead is coupled to and movable relative to the base by several hydraulic cylinders. The columns, which cannot rotate about their axes, are provided with external threads mating with internal threads of flywheels which rotate in response to movement of the frame. The flywheels rotate on thrust bearings

which are installed in recesses provided therefor in the base, and they displace plungers in stationary gas-filled cylinders



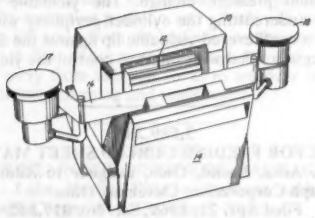
when the downward movement of the frame is terminated or slowed down while the flywheels continue to rotate.

3,589,279

COLORING AND PRINTING EMBOSSED CARDS

Fritz A. Deutsch, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Aug. 13, 1968, Ser. No. 752,362
Int. Cl. B41b *5/00, 1/38;* **B41f** *31/16*
U.S. Cl. 101—27 **4 Claims**



A frame provides sideplates to support pivoted members with stability and to house a power motor with associated equipment.

The machine bed is a pivoted gate mounted on the frame for manual closing. A pivoted platen lays substantially in its final closing position. The gate locks closed to the frame, and then a cam drives the platen into pressure engagement with the gate. The cam cycle turns off the drive and unlocks the gate.

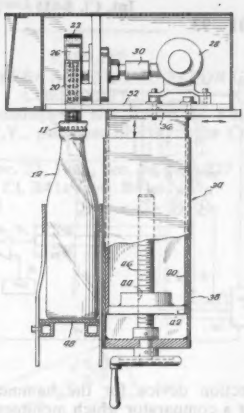
3,589,280

APPARATUS FOR APPLYING ULTRAVIOLET NORMALLY TRANSPARENT INDICIA TO BOTTLE CAPS

Sheldon L. Wilde, Crawfordsville, Ind., assignor to H-C Industries, Inc.

Filed Nov. 15, 1968, Ser. No. 776,114
Int. Cl. B41f *17/00*
U.S. Cl. 101—35 **1 Claim**

Apparatus for coding containers by marking with normally transparent and invisible indicia. The containers are marked by advancing the container past a marking station and bringing a marking member past the station and into contact with the container while moving both the container and marking member at the same rate. Ultraviolet ink is suitable for use as a marking material since it is normally invisible, but can be recalled when desired. Apparatus includes a marking mechanism comprised of a plurality of radially aligned wheels including a drive-transfer wheel frictionally engaged with the surfaces of an ink supply wheel and a marking wheel, and a variable speed motor connected to rotate said



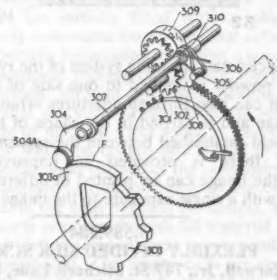
drive-transfer wheel and said printing wheel at selected peripheral speeds such that there is not relative motion between the marking wheel and the container being marked.

3,589,281

VALUE-SETTING MEANS FOR PRINTING WHEELS IN POSTAL FRANKING MACHINES

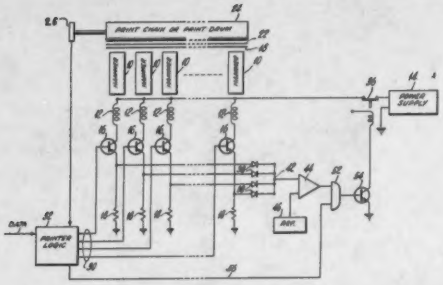
James Woodhead, Lechlade, England, assignor to Roneo Limited, Surrey, England

Filed Aug. 7, 1968, Ser. No. 750,823
Claims priority, application Great Britain, Aug. 17, 1967, 37992/67
Int. Cl. B41j *1/22, 1/34*
U.S. Cl. 101—91 **2 Claims**



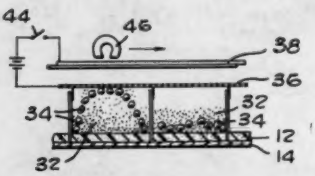
A franking machine having a printing head in which the values to be printed are manually selected by the rotation of value-selecting wheels, one for each printing wheel, by way of a tooth-engaging pinion integral with each value-selecting wheel and in which each toothed wheel is provided with an axial bore with gear teeth therein, which are engaged by a pinion integral with a coarse helical screw having a cooperating nut thereon. Each printing wheel is provided with a pinion which engages a toothed rack joined to each nut by a bar passing through the bore in the toothed wheel. The axes of rotation of the value-selecting wheels, the toothed wheels and the coarse helical screws are all parallel to the axis of rotation of the printing head, while the axes of rotation of the printing wheels is transversal of the axis of rotation of the printing head.

3,589,282
HAMMER PROTECTION DEVICE FOR HIGH-SPEED LINE PRINTERS
Norman R. King, Bayport, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.
Filed Aug. 29, 1969, Ser. No. 854,138
Int. Cl. B41j
U.S. Cl. 101—93 3 Claims



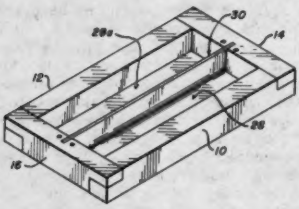
A protection device for the hammers in a high-speed printer has a comparator which monitors the current flow in all of the hammer drive circuits simultaneously. A logic gate couples the comparator output to a protecting relay when the printer hammers are not being fired.

3,589,283
MULTICOLOR ELECTROSTATIC PRINTING SYSTEM
Clyde O. Childress, Palo Alto, Calif., assignor to Electrostatic Printing Corporation of America, San Francisco, Calif.
Filed Feb. 19, 1969, Ser. No. 800,427
Int. Cl. B41f *15/04*
U.S. Cl. 101—115 4 Claims



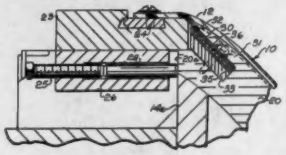
In an electrostatic printing system of the type wherein electroscopic powder is applied to one side of an image screen whereby it can pass through apertures arranged in the shape of an image and is carried in the shape of that image by an electric field established between the screen and a receiving substrate, there is provided an improved arrangement whereby the image can be printed in different colors on the substrate with a single exposure to the image screen.

3,589,284
FLEXIBLY DIVIDED SILK SCREEN
Roy M. Harwell, Jr., 747 St. Michaels Lane, Gastonia, N.C.
Filed June 2, 1969, Ser. No. 829,318
Int. Cl. B41n *1/24*
U.S. Cl. 101—127.1 9 Claims



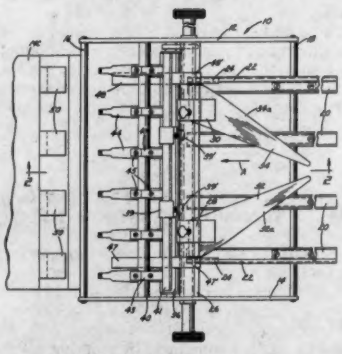
A framed silk screen for application of two or more colors, said screen having a thin, flexible divider strip which separates adjoining color areas. The lower edge of the strip is held by a bonded joint to the silk screen. A method for making the framed screen provides forming a linear pervious area in the screen, mounting the strip so that its edge is aligned with the pervious area, and bonding the strip to the screen by means which allow bonding material to pass through the pervious area of the screen.

3,589,285
CYLINDER WITH YIELDABLE PERIPHERY
Robert J. Anderson, Brecksville, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio
Continuation of application Ser. No. 686,049, Nov. 28, 1967, now abandoned. This application Jan. 20, 1970, Ser. No. 6,333
Int. Cl. B41f *13/08*
U.S. Cl. 101—216 6 Claims



A rotary machine having a cylinder which runs in pressure relationship with a cooperating cylinder. At least one of the cylinders has an axially extending discontinuity in the periphery which periodically causes an interruption in the pressure between the cylinders with the discontinuity having a yieldable portion adjacent the discontinuity for effecting a more gradual pressure change. The yieldable portion is formed by undercutting the cylinder periphery with a recess to provide a cantilevered yieldable lip against the discontinuity. The recess is filled with shims to control the yieldability of the lip.

3,589,286
DEVICE FOR FEEDING CURLED SHEET MATERIAL
Eugene A. Acks, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Apr. 21, 1969, Ser. No. 817,862
Int. Cl. B41f *13/54*
U.S. Cl. 101—228 2 Claims



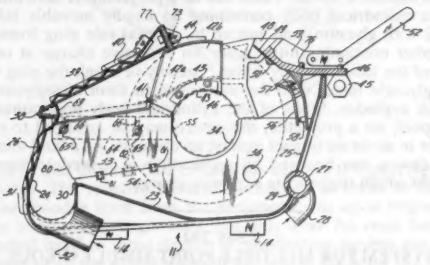
A device for uncurling sheet material, such as moist duplicating masters, includes a pair of blades having diverging outer edges disposed just above a guideway for introducing master sheets. The fingers extend from approximately the center of the sheet guideway diagonally to its side edges so that as the sheet is moved along the guideway it is progres-

sively uncurled and flattened. Retainer strips overlie the margins of the flattened sheet after it leaves the blades to maintain the sheet in its flattened condition to facilitate its attachment to the master cylinder of a duplicating machine.

3,589,287
ROTOGRAVURE INK FOUNTAIN WITH COVER-LIFTING SYSTEM

Richard Woessner, Fairlawn; Jack Bryer, Paramus; Christopher Pali, Ramsey, all of, N.J., and Alexander Benda, Bronx, N.Y., assignors to Wood Industries, Inc., Plainfield, N.J.

Filed May 20, 1968, Ser. No. 730,433
Int. Cl. B41f *1/46*
U.S. Cl. 101—363 **9 Claims**

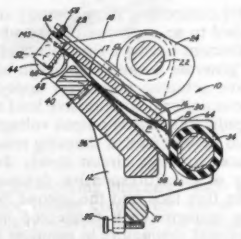


An ink fountain for a rotogravure press which is pivotally mounted and can be tilted down away from the printing cylinder for cleaning the fountain pan or changing the cylinder. A cover system for enclosing the cylinder when the pan is in its operative position and which will automatically cam off or lift away from the cylinder as the pan is lowered away from it. The cover system is hinged to the pan and can be swung away from the pan so as to uncover the pan and cylinder for easy cleaning and replacement.

3,589,288
INK FOUNTAIN FOR DISPENSING PACKAGED INK

Francis K. Lake, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Apr. 3, 1969, Ser. No. 813,004
Int. Cl. B41f *31/06, 31/08*
U.S. Cl. 101—363 **1 Claim**

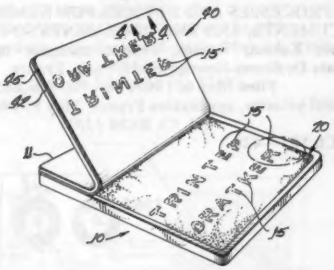


An ink fountain for a printing or duplicating machine for use with packaged ink whereby the package, which has a flexible wall, is placed into the fountain and the ink is dispensed under pressure from the package directly to an ink fountain roller. The pressure causes a bead of ink to be formed under the flexible wall, and the amount of pressure permits the wall to assume a distended position or a retracted position indicative of the amount of ink in the ready supply of ink adjacent the fountain roller. A sensing means is provided for continuously detecting the position of the flexible wall during machine operation. Power means actuates a mechanical means to force ink from the package into the bead and toward the fountain roller when the sensing means detects the retracted position of the flexible wall of the package and deactuates the mechanical means to terminate movement of the ink from the package into the ready supply when the sensing means detects the distended position of the flexible wall of the package.

3,589,289
PRINTING MEMBERS AND METHODS FOR GRAPHIC COMPOSITION

Earl J. Gosnell, Irondequoit, and Robert L. Edsberg, Pittsford, both of, N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 22, 1966, Ser. No. 604,027
Int. Cl. B41c *1/00;* **B41n** *1/00*
U.S. Cl. 101—401.1 **27 Claims**



Apparatus for a gravure-type printing process utilizing a composing member having a multicellular surface pattern, and a pick sheet coated on one side with a layer of polymer-containing, thermoplastic material. All of the cells of the composing sheet are initially filled with a solid material which is selectively removable from individual cells. The cell-fill material is specially formulated to exhibit a specific affinity for the thermoplastic coating on the pick sheet when the coating is activated through localized heating. Graphic representations that are infrared absorbent are recorded on the uncoated side of the pick sheet which is then exposed to infrared radiation while the coated side is held in close contact with the filled cellular surface of the composing member resulting in an adhesive attraction between the coating and the solid material in the cells beneath the indicia. Separation of the two elements removes the cell-fill material from only those cells which define imaged areas corresponding to the indicia to be reproduced. The empty cells are receptive to filling with an ink, while nonimaged areas of the sheet contain no printing cells, so that the composing member can then be used as a printing master. The pick sheet, carrying a discontinuous, raised image, comprising a multiplicity of uniformly distributed, discrete particles of solid material bonded to the thermoplastic coating, can be employed as a relief printing plate.

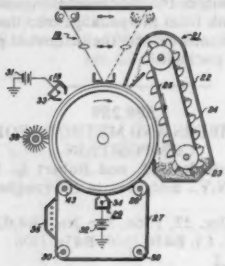
3,589,290
RELIEF IMAGING PLATES MADE BY REPETITIVE XEROGRAPHIC PROCESSES

Lewis E. Walkup, Columbus, Ohio, and Donald L. Miller, East Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed May 20, 1966, Ser. No. 551,761
Int. Cl. G03g *13/22;* **B41m** *1/00*
U.S. Cl. 101—426 **16 Claims**

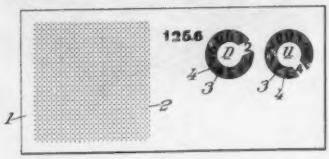
A method of preparing a relief printing master is disclosed

whereby upon repeating in sequence and registration the steps of electrostatic imaging and development the necessary



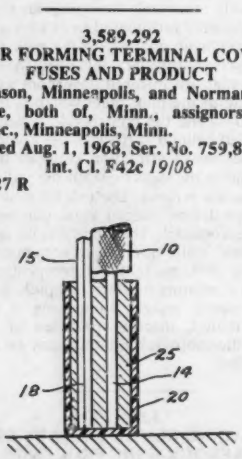
relief image may be established which may be used in a corresponding printing process.

3,589,291
PROCESSES AND DEVICES FOR NUMBERING DOCUMENTS, AND THE DOCUMENTS SO NUMBERED
Jacques Koszul, Vanves, France, assignor to Imprimerie Chaix-Desfosses-Neomgravure, Paris, France
Filed May 6, 1968, Ser. No. 726,685
Claims priority, application France, May 8, 1967, 105,571
Int. Cl. B42d *15/00*
U.S. Cl. 101—426 **2 Claims**



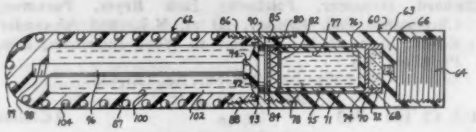
To render difficult the falsification of the last digits of the number of a ticket, for each last digit a series of the ten digits 0 to 9 is printed on this ticket by plate-printing and all the digits except the one desired of each series are cancelled by marks printed in typographic ink. The first digits of the number can also be printed in typographic ink.

3,589,292
METHOD FOR FORMING TERMINAL COVERING FOR FUSES AND PRODUCT
Ralph W. Hanson, Minneapolis, and Norman H. Hoffman, Eden Prairie, both of, Minn., assignors to Technical Ordnance, Inc., Minneapolis, Minn.
Filed Aug. 1, 1968, Ser. No. 759,809
Int. Cl. F42c *19/08*
U.S. Cl. 102—27 R **2 Claims**



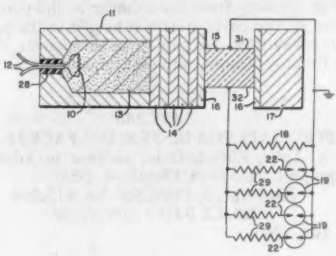
A method for grouping end portions of a plurality of detonating or deflagrating fuses and securing the same together by the application of low point ignition solder to incase said end portions and shape said solder into a desired outer configuration to form a terminal covering as for connection with an ignition means.

3,589,293
EXPLOSIVE DEVICE COMPRISING SEPARATE HOLLOW BODIES WITH GLYCERIN AND NITRIC ACID THEREIN
Emery Major, 109 Graceland Drive, San Rafel, Calif.
Filed Dec. 3, 1968, Ser. No. 780,685
Int. Cl. F42b *13/12, 13/32;* **F24b** *23/00*
U.S. Cl. 102—57 **8 Claims**



An explosive device which can be a projectile or land mine has a cylindrical body containing an axially movable tube filled with glycerin, and spaced by a breakable plug from a chamber containing nitric acid. An explosive charge at one end of the tube violently drives it axially to break the plug so the glycerin mixes with the nitric acid to form nitroglycerin which explodes. Walls of the cylindrical body may contain shrapnel. As a projectile, the device may be arranged to explode in air or on impact against an obstacle. As a land mine, the device can be fired by application of a predetermined weight which triggers the explosive charge.

3,589,294
SYSTEM FOR MULTIPLE POINT SIMULTANEOUS INITIATION OF EXPLOSIVE CHARGES
Richard H. F. Stresau, Washington Grove, Md., assignor to The United States of America as represented by the Secretary of the Navy
Filed June 21, 1957, Ser. No. 667,302
Int. Cl. F42c *11/02, 15/40;* **F42d** *1/04*
U.S. Cl. 102—70.2 A **9 Claims**

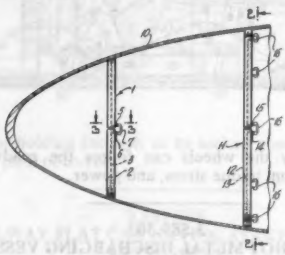


1. A system for controlling the geometry of a detonation shock wave applied to an explosive charge which comprises; a piezoelectric element having a first face and a second face and adapted to generate a voltage between said faces when stressed, explosive actuated means for applying a substantially instantaneous uniform compressive load to said element to produce a rapidly developing output voltage between said first face and said second face, a shunting resistor connected between said faces to short circuit slowly developing voltages, a plurality of electroresponsive detonators also connected across the first face and the second face, and a plurality of limiting resistors each connected in series with a respective one of said detonators to promote simultaneity of initiation of said detonators.

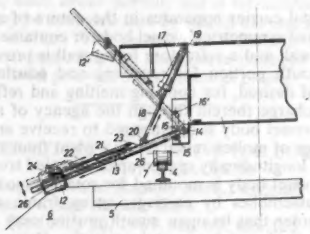
3,589,295
DELAY FUSE MECHANISM
Stanley S. Packer, Palisades Park, N.J., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.
Filed May 24, 1968, Ser. No. 731,969
Int. Cl. F42c *15/40, 1/08, 1/10*
U.S. Cl. 102—75 **4 Claims**

This invention relates to a delay-type fuse and in particular relates to a fuse disposed to rupture after a time lag from time of impact.

A missile cone housing having therein suitably mounted peripheral-type rings, segmented and/or continuous. Also, centrally disposed therein, similarly peripherally oriented, are conductive elements whose opposing extremities are attached via a resistive element so as to complete a current-carrying circuit. The said circuit is an integral part of a trigger device for triggering an explosive so that the interruption of said current flow creates the action for triggering said charge. The resistive element is disposed to break or otherwise dislodge itself from the peripheral ring upon impact of the cone with a target area, but only after the cone has extended itself to some degree of penetration against the said target or to the extent wherein the time it takes for the cone to become flattened or otherwise distorted after the said impact.



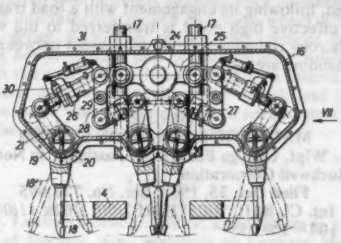
3,589,296
MOBILE TRACK-WORKING MACHINE
Franz Plasser, Johannesgasse 3, and Josef Theurer, both of Vienna, Austria
Filed Nov. 21, 1968, Ser. No. 777,803
Claims priority, application Austria, Nov. 23, 1963, A10615/67
Int. Cl. E01b *27/16, 27/20*
U.S. Cl. 104—12 **4 Claims**



A mobile track-working machine, such as a track liner, carries a surface ballast compactor whose downward pressure is periodically relieved while the machine moves along the track to facilitate the forward movement.

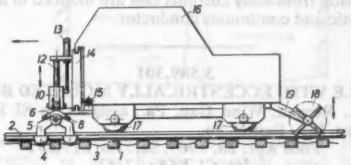
3,589,297
TRACK-TAMPING ASSEMBLY
Franz Plasser, Johnannesgasse 3, 1010 Vienna, and Josef Theurer, both of Vienna, Austria
Filed Apr. 29, 1969, Ser. No. 819,665
Claims priority, application Austria, Apr. 29, 1968, A 4172/68
Int. Cl. E01b *27/16, 27/20*
U.S. Cl. 104—12 **11 Claims**

A track-tamping assembly including a pair of opposed, vibratory and reciprocable tamping tools is mounted with at least some of the mounting and/or drive means for the tamping tools enclosed in a common housing which forms part of



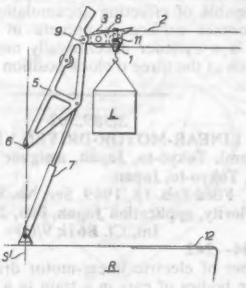
a common lubricating system for all points of the assembly requiring lubrication.

3,589,298
SURFACE BALLAST TEMPER
Franz Plasser, Johannesgasse 3, 1010 Vienna, and Josef Theuer, both of Vienna, Austria
Filed May 13, 1969, Ser. No. 824,122
Claims priority, application Austria, May 14, 1968, A4653/68
Int. Cl. E01b *27/16, 27/20*
U.S. Cl. 104—12 **11 Claims**



A ballast-tamping unit includes two pairs of surface tampers fixedly mounted on two legs of two carrier elements. A common crank shaft supports the two carrier elements independently and vibrates the elements upon rotation thereof. The carrier elements move freely in a plane perpendicular to the crankshaft, and the crankshaft is supported for free movement in a plane perpendicular thereto. The unit is vertically adjustably mounted.

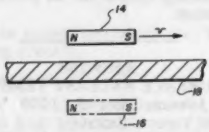
3,589,299
HIGH-LINE CABLE SUPPORT
David John Ingram, Kent, England, assignor to The General Electric and English Electric Companies Limited, London, England
Filed Dec. 10, 1969, Ser. No. 883,857
Claims priority, application Great Britain, Dec. 13, 1968, 59,449/68
Int. Cl. B61b *7/02, 7/04*
U.S. Cl. 104—114 **13 Claims**



A cable support for a high-line load transfer arrangement, especially for use in transferring goods between two ships at

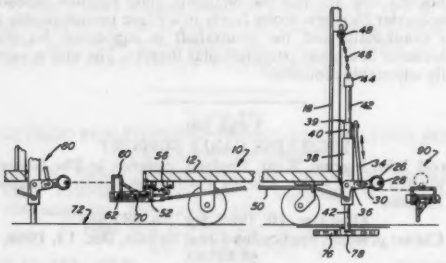
sea, comprising a pivoted arm capable of being raised and lowered, the arm providing a first effective high point for the cable when in the raised position, and being such that when it is lowered, following its engagement with a load transfer trolley, the effective high point is transferred to the vicinity of trolley thereby reducing relative movement between the load and the landing area.

3,589,300
MAGNETIC SUSPENSION SYSTEM
Stefan L. Wipf, Canoga Park, Calif., assignor to North American Rockwell Corporation
Filed Oct. 25, 1968, Ser. No. 770,695
Int. Cl. B01l *13/08*; **H01f** *7/00*; **H02k** *41/00*
U.S. Cl. 104—148 MS **11 Claims**



An improved magnetic suspension system suitable for vehicles wherein a propelled magnet is both levitated and guided by repulsion from eddy currents that are induced in a nonferromagnetic and continuous conductor.

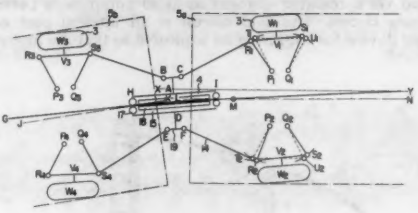
3,589,301
VEHICLE WITH ECCENTRICALLY MOUNTED BUMPER
Larry L. Reagan, Wind Gap, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.
Filed Apr. 28, 1969, Ser. No. 819,592
Int. Cl. B65g *17/42*
U.S. Cl. 104—170 **8 Claims**



A vehicle such as a tow truck is provided with a single bumper capable of effecting accumulation or pushing. The bumper contact surface is arcuate in configuration and preferably is a cylinder eccentrically mounted for rotation about an axis at the three o'clock position within its contour.

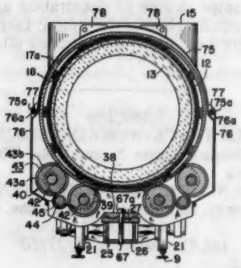
3,589,302
LINEAR-MOTOR-DRIVEN VEHICLE
Yoshio Usami, Tokyo-to, Japan, assignor to Nippon Kokuyu Tetsudo, Tokyo-to, Japan
Filed Feb. 18, 1969, Ser. No. 800,066
Claims priority, application Japan, Feb. 22, 1968, 43/10822
Int. Cl. B61k *9/00*
U.S. Cl. 104—242 **5 Claims**

A number of electric linear-motor driving units are coupled to the bodies of cars in a train in a manner to undergo displacement relative to the bodies when the cars are traveling along a curve and are operating cooperatively with and guided by a reaction rail along a roadway, and this displacement is transmitted by a linkage to steer wheel and suspension systems on which the cars are rolling so as afford bogie



action whereby the wheels can follow the roadway with minimum friction, undue stress, and power.

3,589,303
ROTATABLE HOT METAL DISCHARGING VESSEL CAR
Ira W. Lakin, Volant, Pa., assignor to Pennsylvania Engineering Corporation, New Castle, Pa.
Filed Sept. 13, 1968, Ser. No. 759,598
Int. Cl. B61d *9/02*; **F16h** *13/02*, *15/02*
U.S. Cl. 105—265 **19 Claims**

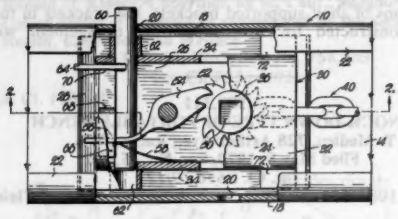


A hot metal carrier apparatus in the nature of a horizontally elongated symmetrical vessel body or container having a metal shell wall and a refractory lining wall is provided with an open mouth portion for receiving and pouring molten metal and, if desired, for applying melting and refining heat to a metal charge therein through the agency of an oxygen lance. The vessel body is constructed to receive and carry a large tonnage of molten metal along a plant floor or the like on a pair of longitudinally spaced-apart wheeled truck assemblies. The vessel body is mounted for rotating movement on the truck assemblies by carriage, swing frame and roller means, in order that its open mouth portion may be moved between vertical and horizontal positions. Drive rollers of each assembly engage an associated rim flange assembly of a spaced pair about the vessel body to support it in a balanced relation and to enable its effective and safe rotation.

3,589,304
LOW PROFILE VEHICLE HOLD-DOWN
James D. Haynes, Shawnee Mission, Kans., assignor to The Darby Corporation, Kansas City, Kans.
Filed Aug. 4, 1969, Ser. No. 847,175
Int. Cl. B61d *45/00*; **B60p** *7/08*
U.S. Cl. 105—369 **5 Claims**

A holddown unit for anchoring cargo such as automobiles and similar vehicles to the deck of a railway car or other transporting equipment is adapted to slide between a pair of opposed side rails secured to the deck and has a winch which includes a rotatable drum to take up a lashing chain. The unit is provided with a two-way, reciprocable locking bolt that is insertable within any one of a series of holes along one of the rails for locating the unit in one position, or within any one of

a series of holes along the other rail for locating the unit in another position. A single, specially configured latch spring is

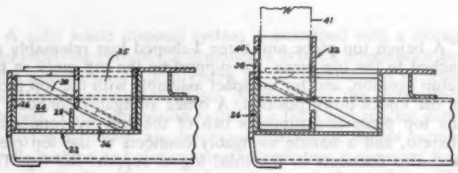


capable of holding the bolt in its locked condition at either end of its path of travel.

3,589,305
RAILWAY FLAT CAR HAVING STAKE POCKET EXTENSIONS

Duane V. Thornton, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed May 15, 1969, Ser. No. 824,964
Int. Cl. B61d *3/08*
U.S. Cl. 105—390 **14 Claims**

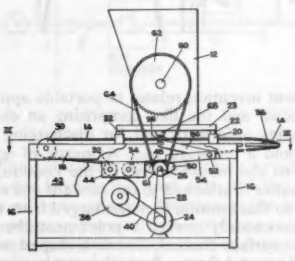


Stake pockets along the sides of the deck of a flat car include a lower portion and a removable extension. Where the lower portions of the stake pockets are below the deck, the extensions or upper portions may be retractable below the deck, or else formed in the ends of pivoted guide rails above the deck, movable into transverse positions on the deck. Alternatively, each lower portion and a retractable extension therefor may be mounted side by side in the end of a pivoted guide rail section. The retractable extensions are guided between their operative and inoperative positions by runners fitted in inclined grooves, or by means of pivots.

3,589,306
INTERMITTENT BELT DRIVE FOR DOUGH DEPOSITING MACHINE

Raymond Logan, Grand Rapids, Mich., assignor to Werner Lehara, Inc., Grand Rapids, Mich.

Filed May 20, 1969, Ser. No. 826,155
Int. Cl. A21c *11/16*
U.S. Cl. 107—27 **7 Claims**

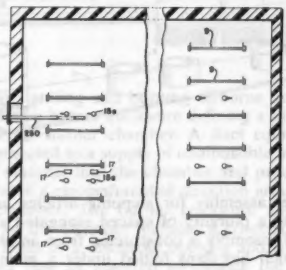


This disclosure relates to depositing of flowable materials such as cookie dough, jams, and the like, the depositing being carried out by forcing the flowable material out through an effluent port of a hopper onto a continuous belt which is moved intermittently between each depositing cycle. The belt is intermittently moved by a drive wheel, which continuously drives a portion of the belt, remote from the depositing hopper, and a pair of reciprocating rollers which move with the drive wheel during a first time interval to take up the slack generated by the drive wheel, and to move against the drive wheel movement at a second time interval to move the belt beneath the depositing hopper.

3,589,307
OVEN

William E. Lanham; Gene C. Miller, and William E. Lanham, Jr., all of Decatur, Ga., assignors to Lanham Machinery Co., Inc., Atlanta, Ga.

Filed Nov. 6, 1968, Ser. No. 773,855
Int. Cl. A21b *1/42*
U.S. Cl. 107—57 **5 Claims**

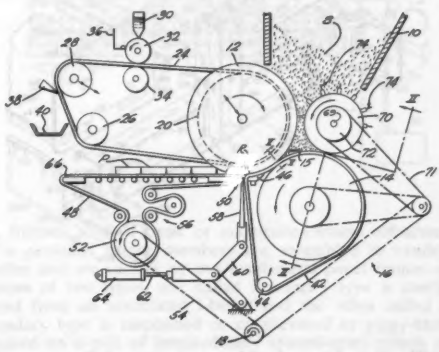


An energy absorbing oven construction wherein the oven is constructed of heat transfer resistant panel members bolted together by exterior frame members and wherein the roof of the oven is unattached such that in the event of an oven blowout the roof panels will lift off without causing disintegration of the oven itself. Burner elements within the oven are placed adjacent a spiral conveyor carrying products to be baked within the oven and the temperature of the burner elements is controlled in such a manner so that uniform heating of the products as they are carried through the oven by the spiral conveyor is maintained.

3,589,308
PATTY MAKING MACHINE

Albert F. Verhoeven, Grand Rapids, Mich., assignor to Werner Lehara, Inc., Grand Rapids, Mich.

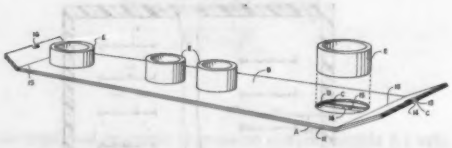
Filed June 16, 1969, Ser. No. 833,565
Int. Cl. A21c *11/10*
U.S. Cl. 107—69 **19 Claims**



Apparatus and method for automatically forming food products, such as, potato patties from shreds, the shreds

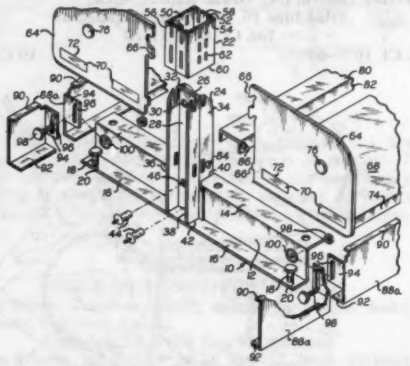
being withdrawn from a hopper onto two endless belts which pass into a nip formed by counterrotating compacting rollers, one of which has a compacting recess formed in its circumference. The ribbon formed by the compaction is cut into patties by a reciprocating knife cutting into the recess. In an alternate embodiment the knife is positioned to bear against the belt onto which the ribbon drops after being formed in the compacting stage. To positively feed the shreds into the compacting rollers, a pin wheel having rows of pins eccentrically mounted with respect to the axis of rotation of the wheel is positioned adjacent to the compacting rollers.

3,589,309
DISPOSABLE PALLET
Alexander B. Clark, Jr., P.O. Box 2012, Hendersonville, N.C.
Filed June 9, 1969, Ser. No. 831,654
Int. Cl. B65d *19/44*
U.S. Cl. 108—55 **3 Claims**



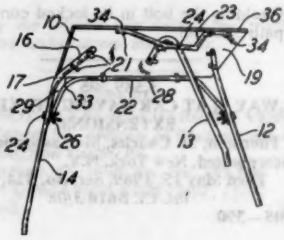
A pallet assembly for shipping articles carried thereon, comprising a plurality of spaced elongated skid assemblies. Each skid assembly is constructed from an elongated scored board which has flaps folded under a main body portion. Hollow tubular members are carried in a pressure fitting relationship in spaced cutouts provided in a main body portion of the blank, and are supported on the folded under flaps. A metal tie-band extends through a groove provided between the edges of the flaps and wraps around the article and skids for holding the skid assembly in position relative to the articles. The ends of the skid assembly are folded upwardly so as to lock the flaps in position.

3,589,310
LIBRARY STACKS AND BASE SUPPORTS THEREFOR
Frank Philip Tucker, 84 Gooseneck Point, Oceanport, N.J.
Filed Oct. 21, 1968, Ser. No. 769,337
Int. Cl. A47b *57/06*
U.S. Cl. 108—108 **14 Claims**



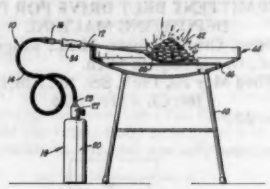
The invention is for library stacks and the construction thereof, and includes special base elements, upright supports, and shelves, with joints so designed as to facilitate quick assembly of the components into self-supporting shelf stacks, multiple shelf stacks, and movable shelf stacks. Spread footings of special construction are employed for optimum stability, with upright end posts carried by the footings, and the posts provided with slotted openings to receive locking projections of shelf supported brackets, the brackets in turn being constructed for firm supporting engagement with shelves.

3,589,311
KNOCK-DOWN TYPE OF PORTABLE BENCH
Richard T. Medien, 728 Arthur Ave., Racine, Wis.
Filed May 8, 1970, Ser. No. 35,696
Int. Cl. B65d *19/12*
U.S. Cl. 108—156 **7 Claims**



A bench top piece and three J-shaped legs releasably attached to the top piece, for supporting the top piece in the setup position, and for compact assembly with the top piece in the knock-down position. A brace swingably connects to the top piece and supports two of the legs by connecting thereto, and a handle swingably connects to the top piece and also connects to the third leg to support the leg. The upper ends of the legs, and the brace and handle, all serve to reinforce the strength of the top piece, by extending along and being connected to the top piece. Clamps are bolted to the top piece for securing the legs, brace, and handle to the top piece in both the setup and knock-down positions.

3,589,312
PORTABLE APPARATUS FOR IGNITING CHARCOAL AND THE LIKE
Milton V. Cooper, 5540 N. W. 23 Apt. #144, Oklahoma City, Okla.
Filed Aug. 4, 1969, Ser. No. 847,236
Int. Cl. F23b *3/00*
U.S. Cl. 110—1 F **3 Claims**



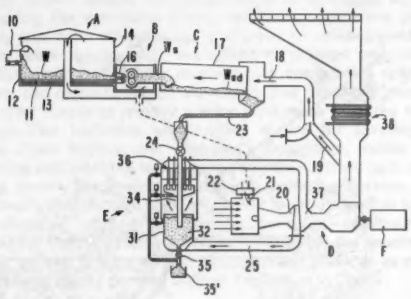
The present invention relates to portable apparatus for igniting charcoal and the like comprising an elongated rigid conduit having a forward end for discharging ignition fuel therefrom and a rearward end. A source of ignition fuel is connected to the rearward end of the conduit, and a dish-shaped member is attached to the forward end of the conduit positioned so that ignition fuel discharged from the conduit is directed downwardly toward a point near the periphery of the concave surface thereof. The dish-shaped member serves to deflect heat and flames from the combustion of the ignition fuel upwardly and outwardly, and may be used to shift charcoal and the like from one position to another before, during and after the ignition thereof.

3,589,313

SOLID WASTE DISPOSAL METHOD AND APPARATUS

Richard D. Smith, Palo Alto; Dale A. Furlong, Sunnyvale, and Ronald D. Kinsey, Cupertino, all of, Calif., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare

Filed Aug. 30, 1968, Ser. No. 756,595
Int. Cl. F23g 5/02
U.S. Cl. 110—8 17 Claims



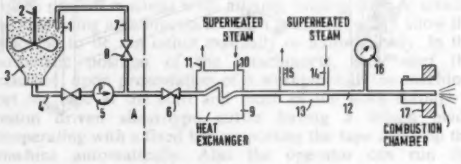
A solid waste disposal system is described with a storage and receiving carousel, a shredder, a dryer, a compressor-turbine assembly for compressing air for combustion of waste and for receiving hot gasses produced in the combustion process. Two combustion systems, a fluid bed reactor and a gasifying pyrolyzer, are described. Particulate matter harmful to the turbine and also causing air pollution is removed from the hot high pressure gas upstream of the turbine. The malodorous air from the waste storage, shredding and drying is compressed and used for combustion and the part of the hot exhaust gases from the turbine are used in the dryer.

3,589,314

METHOD AND DEVICE FOR PRESSURE SPRAYING AND BURNING A COAL DUST-WATER MIXTURE

Herbert Tratz, Ottensoos; Aribert Fracke, Erlangen, and Eduard Weber, Nurnberg, all of, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed July 11, 1969, Ser. No. 841,060
Claims priority, application Germany, July 13, 1968, P 17 51 700.9
Int. Cl. F23b 7/00
U.S. Cl. 110—28 10 Claims



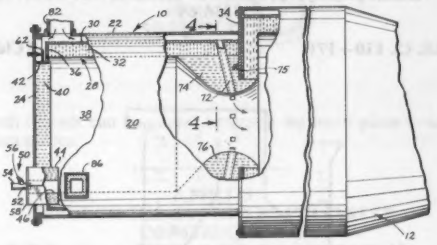
Method of pressure spraying and burning a coal dust-water mixture includes heating the coal dust and the water contained in the mixture, prior to discharging the same from a nozzle at a pressure of several atmospheres excess pressure, to a temperature that is just below the water-vaporizing temperature corresponding to the pressure produced upstream of the nozzle so that the water is pressure-relieved and vaporizes directly after passing through the nozzle; and device for carrying out the method.

3,589,315

APPARATUS FOR IGNITING AND BURNING AIR-BORNE PARTICULATE COMBUSTIBLE MATERIAL

Wilbur E. Hart, Portland, Oreg., assignor to The Bank of California, San Francisco, Calif.

Filed Sept. 11, 1969, Ser. No. 856,996
Int. Cl. F23g 1/02
U.S. Cl. 110—28 2 Claims



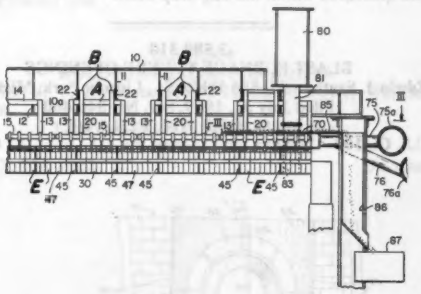
Apparatus for igniting and burning airborne combustible material including a burner enclosure defining a substantially cylindrical internal burner chamber. A duct equipped with blower and connected to a supply of combustible material introduces such material into the chamber and produces flow of such material in a circumferential direction around the inside of said chamber. The burner enclosure adjacent the discharge end of the chamber includes a constricted throat section which leads to a discharge opening and which functions to restrict flow of material to outside the chamber. Means adjacent said throat section introduces air into the burner chamber with such traveling in a circumferential direction complementing the direction of movement of the airborne material introduced through the duct at the feed end of the chamber.

3,589,316

PANELIZED SUSPENDED ROOF FOR REVERBERATORY FURNACE

Levi S. Longenecker, 61 Mayfair Drive, Pittsburgh, Pa.

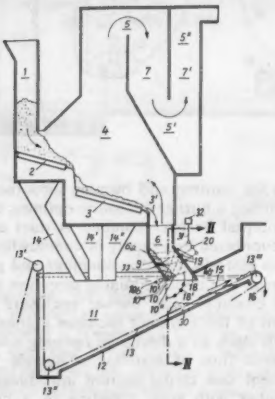
Filed July 18, 1969, Ser. No. 842,918
Int. Cl. F23m 5/02
U.S. Cl. 110—99 17 Claims



A furnace roof of basic or magnesite-chrome refractory tile is provided whose members are assembled in banded bundles and are carried by overhead metal panel frames or sections of two types, one called a primary type is cantilevered from an associated I-beam and the other called a secondary type is suspended or cantilevered or piggy-back mounted on a pair of longitudinally spaced-apart panels of the first type. Tile of the bundles are metal-clad in an improved manner as a bundle and for hot patching are provided with a sandwich or assembly of asbestos and metal plate members. Upper reaches of the tile members are sealed-off

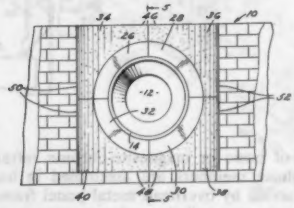
from charging spillage and dust that may be recovered for use in the furnace; air cooling is facilitated.

3,589,317
METHOD AND APPARATUS FOR COOLING SLAG COMING FROM A COMBUSTION FURNACE
Robert Kunovits, Zurich, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland
Filed Mar. 3, 1970, Ser. No. 16,131
Claims priority, application Switzerland, Mar. 5, 1969, 3356/69
Int. Cl. F23j *1/02*
U.S. Cl. 110—171 **9 Claims**



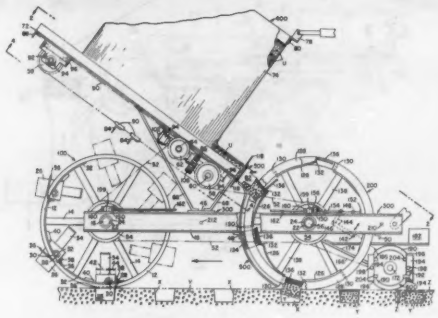
There is disclosed a method and apparatus for cooling slag emanating from a combustion furnace operating with wet slag removal, wherein the slag is permitted to fall into the water bath of a slag removal device through the agency of a slag drop shaft which is closed at all sides about its periphery, the slag drop shaft being disposed between the combustion compartment of the furnace and the water bath of the slag removal device. According to an important aspect of the invention, the slag is periodically restrained and dammed up in the slag drop shaft along its fall path from the discharge end of the combustion grate into the water bath of the slag removal device, and further, this slag is sprayed with water and quenched within the slag drop shaft.

3,589,318
BLAST FURNACE TUYERE OPENINGS
Edwin J. Szatkowski, 586 White St., Lincoln Park, Mich.
Filed July 31, 1969, Ser. No. 846,460
Int. Cl. C21b *7/16;* **F23l** *5/00*
U.S. Cl. 100—182.5 **12 Claims**



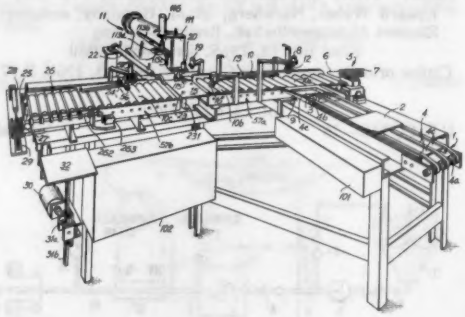
A novel construction for the tuyere openings into a blast furnace including four quadrant ceramic cast parts and four carbon block cast parts to replace the conventional more complicated brickwork. The precast parts with a minimum of fitting may be used for all blast furnace sizes commonly used today. The precast parts eliminate the extensive hand fitting of the brickwork required in conventional construction and, as a result, significantly lower the cost in labor and time for tuyere construction and replacement.

3,589,319
SOIL TREATING MACHINE
Gerald L. Peters, 2208 Shadecrest Road S.E., Huntsville, Ala.
Filed Sept. 19, 1968, Ser. No. 760,950
Int. Cl. A01c *5/04, 11/00;* **A01b** *45/04*
U.S. Cl. 111—2 **7 Claims**



A soil treating machine having a forward positioned coring wheel member for removing cores of sod and an after positioned sod planting wheel member for implanting cores of sod in voids created by the coring wheel member.

3,589,320
POCKET BLANK SEWING MACHINE
Aubrey G. Beazley, El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.
Filed Aug. 19, 1969, Ser. No. 851,303
Int. Cl. D05b *19/00*
U.S. Cl. 112—121.11 **10 Claims**



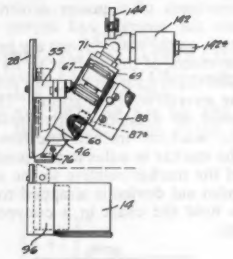
An automatically operating sewing apparatus having the following combination of coacting elements to accomplish the sewing of a pocket blank: means for feeding into a pickup feed position a workpiece; pickup and transfer means for removing a single workpiece from the pickup feed position and transferring the same to a position for feeding to a sewing machine, including holding means for holding the removed workpiece for feeding said workpiece to the sewing machine; conveyor means to the sewing machine for transporting said workpiece thereto including detaching means for separating from the pickup and transfer means the workpiece held in the feeding position, and means for feeding the work-

piece to the sewing machine in response to a demand from said sewing machine, said conveyor means including edge guiding means for guiding the workpiece toward said sewing machine while said workpiece is being conveyed towards the sewing machine; means for initial guiding of the workpiece from said conveyor means into a sewing position; feeding means for said workpiece during sewing operatively interconnected to said sewing machine including workpiece engaging and guiding means operative during said sewing; means for guiding the workpiece during a sewing operation; sewing slowdown and stopping means for said sewing and feeding means responsive to a workpiece position detecting and a sewing control means, including means to disengage means for guiding the workpiece during the sewing operation; positioning means for changing the workpiece to another position and to allow sewing said workpiece in at least one other direction, said positioning means being operatively responsive to the interconnected slowdown and stopping means; conveying means to remove a sewn workpiece from the sewing machine including accelerating means for severing a thread chain holding one workpiece to another; means for removing and stacking said severed workpiece from said conveying means. Employing the above described apparatus, exceptionally trouble free operation, with high production rates are obtained without employing complex constraining devices for the pocket blank and accomplishing the results by relying on free flowing nature of the pocket blank as as controlled by properly devised control circuits.

3,589,321
WORKPIECE SENSOR AND TAPE CUTOFF FOR SEWING MACHINES

Roy E. Miller, Mechanicsburg, and Robert F. Miller, Camp Hill, both of, Pa., assignors to The Reece Corporation, Waltham, Mass.

Division of Ser. No. 695,812, Oct. 31, 1967, Pat. No. 3,425,323.
Filed Oct. 22, 1968, Ser. No. 769,660
Int. Cl. D05b *37/04*
U.S. Cl. 112—130 **2 Claims**



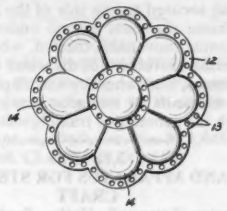
The present machine is for affixing binding tapes to articles and including attachments for such machines which allow the machine to be run either manually or automatically. In the automatic position of the attachments, they start the machine, upon presentation of a workpiece to the machine, cut the tape at the start and finish of the work through a piston driven shear-type cutter having a driven blade cooperating with a fixed bar supporting the tape and stop the machine automatically. Also the operator can run the machine manually and stop the machine at any time when running the machine in said automatic position of the attachments.

3,589,322
MOTIF PIECE

Ryozo Hirokawa, 29, No. 1 1 Cho-me Minami-Eganoso, Habikino, Japan

Filed July 23, 1969, Ser. No. 843,959
Int. Cl. D05b *93/00*
U.S. Cl. 112—401 **1 Claim**

A motif piece which is a substantially flat solid piece of material having a periphery of the desired shape. A plurality of thread holes is provided around the periphery through

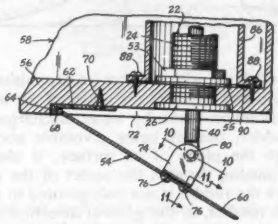


which threads can be passed to attach the motif piece to adjacent pieces.

3,589,323
THROUGH-THE-BOTTOM BOAT LEVELER CONSTRUCTION

Frank T. Kercheval, 530 North Hills Drive, St. Louis, Mo.

Filed Mar. 26, 1969, Ser. No. 810,468
Int. Cl. B63b *1/22*
U.S. Cl. 114—66.5 **4 Claims**

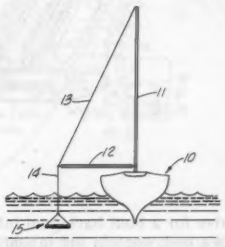


A through-the-bottom boat-leveling construction incorporating stabilizing tabs for pivotal mounting to and beneath the bottom of a boat, cylinder units including fluid actuated spring return pistons mountable within a boat for extension of the piston rods through the bottom thereof for operative pivotal connection with the tabs, an electric hydraulic control system operatively connectable with the cylinder units and mountable in a boat, and a leak containing casing abut each cylinder unit.

3,589,324
ROLL STABILIZER FOR BOATS

Schuyler V. V. Hoffman, 15146 La Calma Drive, Whittier, Calif.

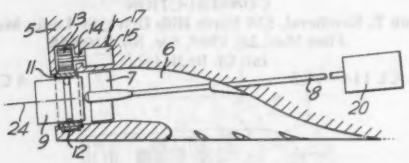
Filed Dec. 2, 1969, Ser. No. 881,560
Int. Cl. B63b *39/00*, *43/02*
U.S. Cl. 114—122 **9 Claims**



A stabilizer device for minimizing roll of a floating vessel comprises a submergible rectangular frame having a harness

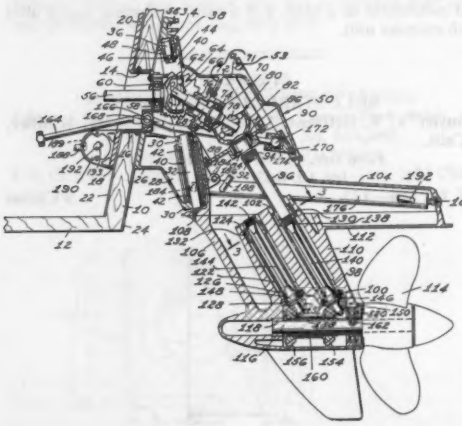
for suspending it in the water outboard of the vessel and for maintaining it in substantially horizontal position. Four flexible nonmetallic flaps triangular in outline cooperate to cover substantially the full area of the frame, one edge of each of the flaps being secured to one side of the frame, respectively. Transverse frame elements extend under the flaps to limit downward flexing movement thereof, whereby the flaps flex upward to permit movement of the water upward through the submerged frame, and whereby the flaps engage the transverse frame elements to minimize downward movement of water through the submerged frame.

3,589,325
METHOD AND APPARATUS FOR STEERING MARINE CRAFT
Edward Gunston Tattersall, Hythe, Southampton, England, assignor to Hovermarine Limited, London, England
Continuation-in-part of application Ser. No. 672,067, Oct. 2, 1967, now abandoned. This application Nov. 27, 1968, Ser. No. 779,348
Int. Cl. B63h *11/00*
U.S. Cl. 115—12 R **13 Claims**



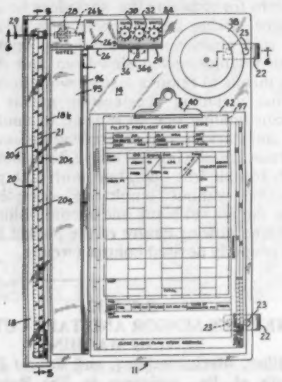
A marine craft fitted with a water-jet propulsion unit having a rudder disposed adjacent the outlet of the unit so as to influence the direction taken by water discharged from the outlet. The rudder, besides being pivotable about an axis passing through the plane of its surface, is also rotatable about an axis passing through the outlet of the unit. When executing a turn the rudder is not only pivoted to execute the turn but is also rotated, in the general direction of the turn, so as to create an upward component of force on the rudder which tends to cause the craft to bank into the turn.

3,589,326
INBOARD OUTBOARD DRIVE
Aldo Celli, 601 Fisher Bldg, Detroit, Mich.
Filed July 30, 1969, Ser. No. 846,024
Int. Cl. B63h *5/12, 25/42*
U.S. Cl. 115—35 **13 Claims**



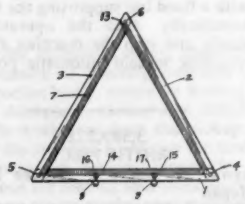
A stern drive for a boat having an inboard engine and an outboard drive unit wherein the inboard drive shaft is connected to the propeller shaft by a two section power transmission shaft, the first section being connected to the engine drive shaft at one end by a first universal joint and connected to the second section by a second universal joint. The second section of the power transmission shaft inclines downwardly and rearwardly and is connected to the propeller shaft at an acute angle by two pair of bevel gears. The drive unit is supported for universal pivoting movement about the axis of the first universal joint. A steering mechanism and a shock-absorbing unit are enclosed within the casing for the drive unit.

3,589,327
PORTABLE PILOT AIR DEVICE
Harold Jacobs, 6750 West Grand Ave., Chicago, Ill.
Filed Aug. 27, 1969, Ser. No. 853,270
Int. Cl. B60k *35/00*; **B64d** *43/00*
U.S. Cl. 116—29 **19 Claims**



A portable pilot aid device has a frame formed by two confronting members hinged together along one side thereof and resiliently urged together to form a clamplike structure adapted to receive a folded navigation map in any selected orientation so a particular selected flight path which the pilot is to fly is conveniently positioned be viewed by the pilot. The selected flight path on the map is positioned parallel to the path of movement of a power driven visible marker which represents the aircraft and moves parallel to the selected flight path on the map. Means are provided to adjust the speed of movement of the marker so its movement relative to the parallel flight path on the map corresponds to the movement of the aircraft over the ground. The marker is at a zero mileage point on a continuously moving endless belt which has mile markers formed thereon indicating the distance from the marker in miles to any point along the path of movement of the marker relative to the scale of the map involved. The pilot aid device is strapped to the pilots knee when in use to hold the chart in a convenient location in front of the pilot.

3,589,328
SAFETY SIGNAL DEVICE
John M. Kiniry, Satellite Beach; Anthony Finazzo, Indian Harbour Beach, and John R. Carroll, Satellite Beach, all of, Fla., assignors to Tri-Vec, Inc., Satellite Beach, Fla.
Continuation-in-part of application Ser. No. 739,844, June, 1968. This application July 17, 1969, Ser. No. 842,520
Int. Cl. G08b
U.S. Cl. 116—63 **1 Claim**



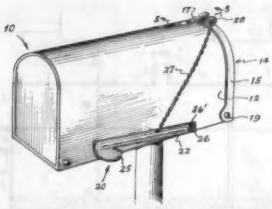
A triangle emergency vehicular traffic diversion signal constructed of elements including the triangle members of

uniform width and thickness for quick assembly into a triangular yield signal and the leg support members of uniform width and thickness. The elements are made of a material including an impregnated fluorescent material. The triangle members include a light-reflecting material thereon.

3,589,329
SIGNAL FOR MAILBOXES

Henry E. Schuh, Clarence, N.Y., assignor to Schuh Signals, Inc., Clarence, N.Y.

Filed July 22, 1969, Ser. No. 843,300
Int. Cl. G08c *5/00*
U.S. Cl. 116—132 R 3 Claims

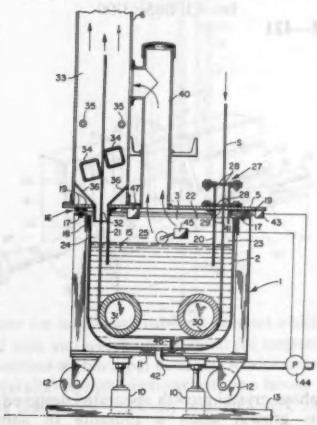


A signal attachment for a mailbox having a hinged door, comprising a lever arm adapted to be pivotally mounted at one end to the base portion of a standard type mailbox and carrying at its other end an angularly bent signal plate, in combination with a chain connected to the mailbox door at a position offset from the door hinge axis. The signal arm is adapted to be manually set in inconspicuous position alongside the base of the mailbox, and the parts are so arranged that when the mailman opens the door to deposit mail in the box, the signal arm is pulled upwardly into an upstanding attitude, whereby the signal plate portion thereof is erected into prominently displayed position.

3,589,330
STRIP-COATING APPARATUS

Alexander V. Alexeff, Cleveland, Ohio, assignor to Alexeff-Snyder Enterprises, Cleveland, Ohio

Filed Aug. 20, 1968, Ser. No. 754,082
Int. Cl. B05c *11/06, 11/10*
U.S. Cl. 118—4 8 Claims

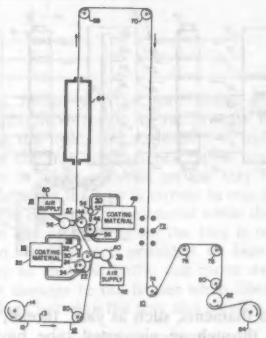


Strip-coating apparatus including a tank divided into a pair of end chambers and an intermediate chamber by a pair of vertical plates projecting into the tank from an upper sealing plate thus to eliminate disturbance of the liquid surface in the intermediate chamber by strip material entering and leaving the two end chambers.

3,589,331
APPARATUS FOR COATING METALLIC FOIL

Dean C. Westervelt, Bear Rocks, Acme, Pa., and William S. Gorton, Athens, Ga., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1969, Ser. No. 813,440
Int. Cl. B05c *11/00, 1/04*
U.S. Cl. 118—62 7 Claims

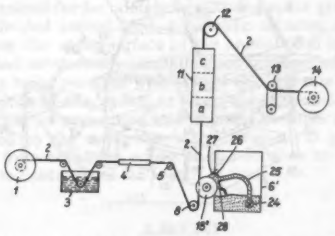


Apparatus for uniformly coating metallic foil with liquid insulating material, wherein air pressure is used to gently press the foil against a coating applicator roll. The air pressure against the foil enables it to be uniformly coated, without disturbing a liquid coating which may already have been applied to the side subjected to the air pressure.

3,589,332
APPARATUS FOR INSULATING THIN ELECTRIC CONDUCTORS, PARTICULARLY EXTREMELY THIN COPPER CONDUCTORS, WITH THERMOPLASTIC SYNTHETIC MATERIALS

Bernhard Dinse, Schwekertdam 322, 1 Berlin 13, Germany

Filed July 18, 1968, Ser. No. 745,763
Int. Cl. B05c *1/08*
U.S. Cl. 118—67 1 Claim



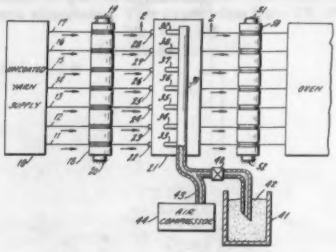
Apparatus for insulating thin electric conductors, particularly extremely thin copper conductors, with thermoplastic synthetic material includes a tank for containing a thixotropic dispersion of the synthetic material, a coating roller mounted outside the tank and provided with a pair of spaced

surfaces between which the conductor is to be passed in a vertical direction, and means for supplying the dispersion from the tank to the coating roller in an amount adequate for coating the electric conductor therewith, the coating roller being rotatable in a direction opposite to the direction in which the conductor is to be passed.

3,589,333
APPARATUS FOR COATING ELONGATED FILAMENT WITH PLASTIC

John J. Quackenbush, Monroe, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 2, 1967, Ser. No. 635,460
Int. Cl. B44d 1/094; B05b 7/08
U.S. Cl. 118—69 **5 Claims**

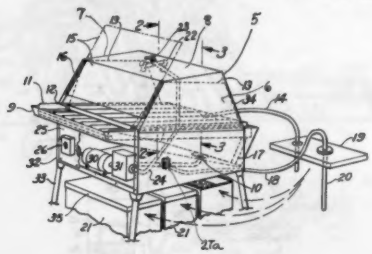


Elongated filaments, such as yarn, thread, string and rope are moved through an elongated tube having an internal diameter greater than the exterior diameter of the filament. An inlet connection to the tube is connected to a source of dry plastic powder which is blown into the inlet and the tube while the filament is moving through the tube. The power coats the filament and the filament is moved into a curing oven in which the plastic powders melt and coalesce on the filament with the plastic subsequently being cooled to produce a plastic-coated filament having good water-resistant qualities, a glaze finish and additional strength.

3,589,334
SEMIAUTOMATIC MACHINE FOR APPLYING LIQUID COATINGS TO PANS

Stanley T. Athas, Lowell, Mass., assignor to United Bakery Engineering Corporation, Framingham, Mass.

Filed Nov. 13, 1969, Ser. No. 876,483
Int. Cl. B05c 5/00, 11/16
U.S. Cl. 118—326 **2 Claims**

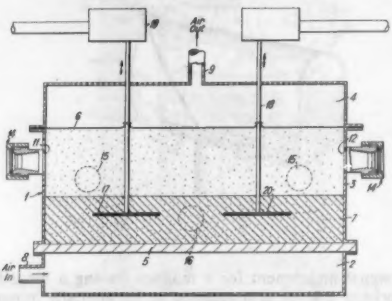


A machine is described for selectively coating a baking pan or baked goods with different liquids, as for example, grease, egg wash and glazing, in a rapid manner without the risk of contamination of one material by the other. The machine comprises a trough supporting a perforated pan support covered by a lateral housing containing a spray head. With one of the liquids recirculation is from the trough to the spray head. For a different liquid an insert is provided on top of the pan support which isolates it from the sidewalls of the housing and a separate container is caused to recirculate the different liquid.

3,589,335
APPARATUS FOR APPLYING POWDER TO ELONGATED ARTICLE

Francis Peter Harthman, Chester, and Robert John Jones, Frodsham, both of, England, assignors to British Insulated Callender's Cables Limited, London, England

Filed Sept. 22, 1969, Ser. No. 859,713
Claims priority, application Great Britain, Sept. 23, 1968, 45131/68
Int. Cl. B05c 3/02
U.S. Cl. 118—405 **11 Claims**

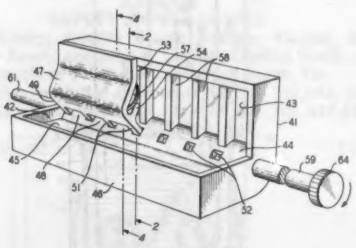


A fluidized bed-coating chamber, having entry and exit ports for passing an elongated object through the fluidized bed, is divided into a vertical arrangement of a lowermost gas feed chamber for fluidizing particulate coating stuff, a central chamber containing the fluidized bed and a top chamber providing for egress of the carrier gas. A porous membrane divides the upper chambers whereby to retain the particulate material in the central chamber and the latter chamber having vibrating means disposed therein.

3,589,336
HORIZONTAL LIQUID PHASE EPITAXY APPARATUS

Arpad A. Bergh, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 29, 1969, Ser. No. 888,335
Int. Cl. B05c 3/00
U.S. Cl. 118—421 **5 Claims**



A liquid phase crystal growth apparatus designed to permit simultaneous growth upon a plurality of substrates is described. The apparatus includes a container having a pair of compartments for containing a melt during various stages in the operation of the process, one of said compartments including means for holding the substrates. In the growth process, the container is rotated, thereby effectuating flow of

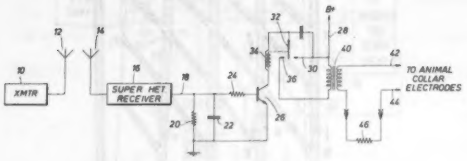
the melt from one compartment to the other with the concurrent dropping of substrates upon the melt surface. Growth is then initiated by cooling a saturated melt.

3,589,337

RADIO CONTROLLED ANIMAL TRAINING DEVICE

Thomas H. Doss, P.O. Box 10839, Houston, Tex.

Filed Oct. 6, 1969, Ser. No. 864,073
Int. Cl. A01k *15/00*
U.S. Cl. 119—29 5 Claims



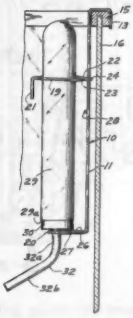
For use in training an animal with equipment including a transmitter and a receiver attached to a collar or harness on the animal, the improvement which incorporates a receiver circuit communicated with a suitable amplifier for transmitted signals and a suitable voltage which provides a slight shock to the animal as an aid in training, the voltage being adjustable to reduce or increase the amount of shock applied to the animal.

3,589,338

HOLDER FOR TUBE AND BOTTLE FEEDERS FOR PETS

David D. Lovitz, Short Hills, N.J., assignor to Sternco Industries, Inc., Harrison, N.J.

Filed Aug. 22, 1969, Ser. No. 852,325
Int. Cl. A01k *09/00*, *39/00*
U.S. Cl. 119—51 4 Claims



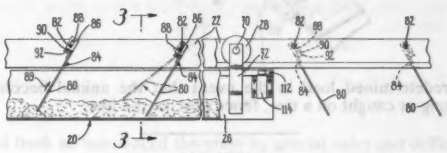
A holder for bottle and tube pet feeders which have a bottom feed pipe and which are adapted for suspension in an inverted position within a pet housing. A wire bracket comprising two parallel upright sections with top hooks supports two forwardly positioned vertically aligned loops, the upper and larger loop being adapted for engagement with the body of the bottle or tube feeder, the lower loop being adapted for underlying supporting engagement with the feeder and in embracing engagement with the feed pipe, whereby the feeder and feed pipe are maintained against displacement.

3,589,339

RESILIENT BAFFLE-TYPE RECIPROCATING THROUGH LIVESTOCK FEEDER

Gerald L. Schoen, Kaukauna, Wis., assignor to Badger Northland Inc., Kaukauna, Wis.

Filed Nov. 10, 1969, Ser. No. 875,005
Int. Cl. A01k *05/02*
U.S. Cl. 119—56 1 Claim



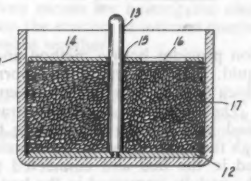
A baffle-type feeder with an open-ended elongated tray mounted on rails, drive means to reciprocate the tray back and forth along the rails, and a plurality of baffles pivotally mounted above the tray so that each baffle can freely pivot out of the way to allow material on the tray to be carried under the baffle when the tray is moved in one direction and so that the baffle can hold the material while the tray moves out from under the material when the tray is moving in the other direction. Springs are provided to bias each baffle toward the tray so that the baffle can move away from the tray to prevent damage to the feeder when fibrous or caked material is wedged between the tray and a baffle.

3,589,340

ANIMAL FEEDER

Robert P. Beliles, Thiensville, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 15, 1969, Ser. No. 841,767
Int. Cl. A01k *05/00*
U.S. Cl. 119—61 3 Claims



The animal feeder comprises a container for granulated or finely divided animal food, a platelike member designed to rest upon the upper surface of the animal food in said container and substantially retain the food in place, said platelike member being provided with at least one aperture adapted to permit at least one animal to take food from said container, and means for preventing said platelike member from being displaced by the animal in such a way as to prevent the animal from obtaining access to the food or to permit the animal to contaminate the food.

3,589,341

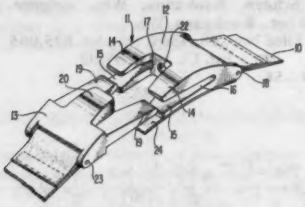
ANIMAL COLLAR WITH MAGNETIC FASTENER

Jacob Krebs, Philadelphia, Pa.

Filed Sept. 24, 1969, Ser. No. 860,679
Int. Cl. A01k *27/00*
U.S. Cl. 119—106 8 Claims

An animal collar particularly adaptable to cats has a permanent magnet fastener which is smooth and free of projections when coupled. The fastener embodies interfitting sections which are easy to engage and separate by a simple

pushing and pulling operations. Conventional buckle hardware is completely eliminated. The collar will open under a



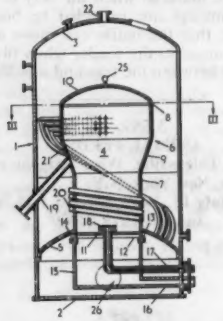
predetermined load in the event that the animal becomes hung or caught on a tree, fence post, or the like.

3,589,342

HEATING APPARATUS

Michael H. Barker, Ockley, Surrey, and Stephen J. Wright, Leatherhead, Surrey, both of, England, assignors to Coal Industry Patents Limited, London, England

Filed May 5, 1969, Ser. No. 821,778
Claims priority, application Great Britain, May 9, 1968, 22067/68
Int. Cl. F22b *1/00*
U.S. Cl. 122—4 **12 Claims**



The invention provides both a method and apparatus for heating a liquid. The apparatus incorporates a furnace chamber in which fuel, such as particulate coal, is burnt in a fluidized bed. The heat from the bed is transferred to the liquid contained in a jacket surrounding the furnace by transfer through the furnace casing, by transfer through conduits immersed in the bed and connected with the jacket through which conduits immersed in the bed and connected with the jacket through which conduits the liquid passes, and by transfer from exhaust gases of combustion fed through smoke tubes passing through the jacket. The liquid vapor produced by heating is drawn off the apparatus for use in further apparatus such as steam turbines.

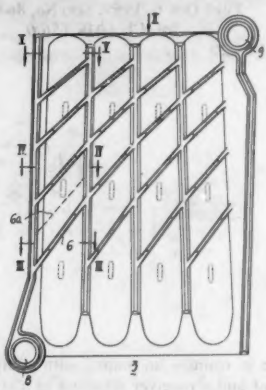
3,589,343

BOILER HAVING TAPERED DUCT ELEMENTS

Ferroli Tredicesimo Luciano, Bonifacio, Italy, assignor to FER Fabbrica Europea Riscaldamento S.P.A., Gambellara, Vicenza, Italy

Filed Jan. 17, 1969, Ser. No. 792,077
Claims priority, application Italy, Jan. 25, 1968, Nov. 13, 1968, 12003/68;23683/68
Int. Cl. F22b *23/00*
U.S. Cl. 122—225 **2 Claims**

A boiler wherein the hot combustion gases flow upwardly through ducts to transfer their heat to a fluid such as a liquid which engages the duct walls at the sides of the latter opposition from the duct interiors. The boiler is composed of a number of sections which butt against each other. The face of one section which butts against the face of an adjoining section is formed with a series of vertically extending half channels, and the channels of the butting faces of adjoining sections register to form gas ducts up which the hot combustion gases flow. Each of the butting faces of each section is formed with a series of these half channels located one next to the other so that the butting faces of the pair of adjoining sections form a plurality of upwardly directed ducts for the gases. The ducts taper in an upward direction so as to have at their upper ends outlets which are of smaller cross-



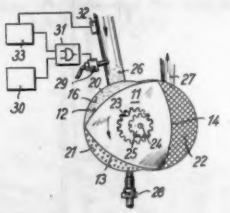
sectional area than their bottom inlet ends. Also, inclined fins distributed along the interior of the half channels of one section coact with oppositely inclined fins distributed along the interior of the half channels of the butting section to form helicoidal fins in the interior of the gas ducts, and these fins are located closer to each other in the region of the upper outlet end of the gas ducts than in the region of the lower inlets thereof.

3,589,344

FUEL INJECTION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Leo Steinke, Hegnach, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 7, 1969, Ser. No. 797,458
Claims priority, application Germany, Feb. 16, 1968, P 16 01 365.3
Int. Cl. F02b *53/12*
U.S. Cl. 123—8.09 **9 Claims**



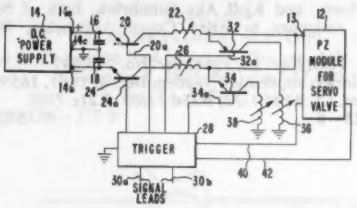
An arrangement in which fuel is inhibited from being injected into the combustion chamber of an internal combustion engine when the engine is operated at idling speed or low load conditions. Fuel is injected into the engine through an electromagnetically controlled fuel injection valve which is opened by an electrical pulse during the fuel injection process. Electrical pulses from a pulse emitter are inhibited by a gating circuit for at least every second fuel injection process when the engine is at idling speed or driving a substantially small load. The operating state of the engine is automatically established through a pressure sensing device within the air intake manifold of the engine. The pressure-sensing device actuates the gating circuitry when the pressure within the air intake manifold is within a predetermined pressure region.

3,589,345

ELECTROMECHANICAL CONTROL SYSTEM

Glendon M. Benson, Danville, Calif., assignor to Physics International Company, San Leandro, Calif.

Division of Ser. No. 671,060, Sept. 27, 1967, Pat. No. 3,500,799.
Filed July 16, 1969, Ser. No. 862,108
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 E 4 Claims



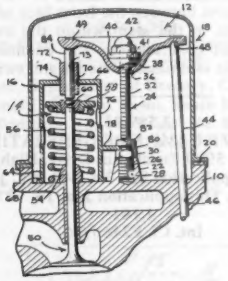
An electromechanical control system for controlling the timing, duration of excitation, and function of a transducer. A control system for controllably actuating two or more electromechanical transducers in precise timed relationship to one another. A control system for controlling the injection of fuel into the cylinders in a multicylinder engine.

3,589,346

OVERHEAD VALVE ACTION AND AIR POLLUTANT DEVICE

Robert C. Warren, 26 Salem Avenue, and Robert G. Adams, P.O. Box 508, both of Carbondale, Pa.

Filed May 6, 1969, Ser. No. 822,219
Int. Cl. F01l *1/14, 1/18, 3/24*
U.S. Cl. 123—90.41 4 Claims



A motion-transmitting guide for overhead valve actuating systems for internal combustion engines to take up any horizontal force normally transmitted to the valve stem by the pivoting of the rocker arm assembly.

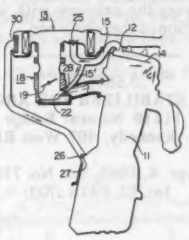
3,589,347

CRANKCASE VENTILATION SYSTEM

Hiraki Sawada, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 25, 1969, Ser. No. 802,136
Claims priority, application Japan, July 17, 1968, 43-50346
Int. Cl. F02f *9/00*; F02m *25/06*
U.S. Cl. 123—119 B 18 Claims

A crankcase ventilation system to be used on an automotive engine, adapted on the one hand to draw blowby gases from the crankcase interior not only to the air cleaner but to the intake manifold of the engine and on the other to supply the crankcase with fresh air for scavenging the interior thereof. The blowby gases are pulled out of the crankcase



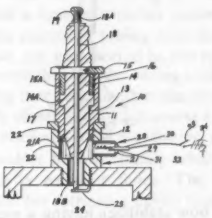
and fresh air introduced thereinto by special valve and orifice arrangements operating in close relation with the pulsation of the intake manifold vacuum.

3,589,348

SPARK PLUG AND HEATED ADAPTOR THEREFOR

Robert Reichhelm, Wallingford, Conn., assignor to Burnham Corporation, Irvington, N.Y.

Filed Feb. 5, 1969, Ser. No. 796,745
Int. Cl. F02p *13/00*
U.S. Cl. 123—169 PB 5 Claims



This disclosure is directed to a spark plug and an adapter therefor in which the spark plug is rendered detachably connected to the adapter, and which adapter is further provided with one or more means for heating the electrodes of the plugs to facilitate the starting of internal combustion engines in cold and/or moist weather.

3,589,349

BALL-GRIPPING AND THROWING APPARATUS

Robert J. Parker, 58 Mosher Ave., Battle Creek, Mich.

Filed July 9, 1969, Ser. No. 840,434
Int. Cl. F41b *3/04*
U.S. Cl. 124—5 7 Claims

An improved ball-gripping and throwing apparatus wherein the ball-holding member is nonadjustably and immovably

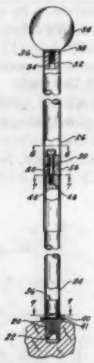
fixed to the spring handle by an integral extension of the ball-gripping arm elements, the ball-holding member otherwise including a pair of spaced flexible gripping leaves and a pair of pressure arms adjustably forced against the outside of the gripping leaves to vary the pressure with which they engage and hold a ball positioned therebetween.

3,589,350

ADJUSTABLE STABILIZER FOR ARCHERY BOW

Earl H. Hoyt, Jr., 11510 Natural Bridge Road, Bridgeton, Mo., and Paul N. Kennedy, 407 West Ridge Drive, O'Fallon, Mo.

Filed Apr. 4, 1968, Ser. No. 718,666
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 **6 Claims**



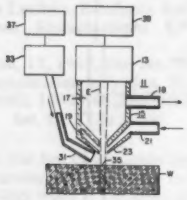
An archery bow stabilizer having a weighting element and an elongated telescopically adjustable support for supporting the weighting element in selective spaced relationship with a bow, the support comprising an elongated round member slidably fitted into tubular member, the round member having a short cylindrical element eccentrically pivoted on the end thereof and nicely fitting the bore of the other member whereby the eccentrically pivoted cylindrical member locks the telescoping members in adjusted position when one member is rotated relative to the other and readily releases the members when the one is rotated oppositely relative to the other.

3,589,351

CUTTING OF ROCKS, GLASS AND THE LIKE

William E. Shoupp, and Berthold W. Schumacher, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 756,653, Aug. 30, 1968, Pat. No. 3,556,600. Filed Mar. 16, 1970, Ser. No. 19,732
Int. Cl. B28d *1/28;* **B23k** *15/00;* **E21c** *37/20*
U.S. Cl. 125—1 **5 Claims**



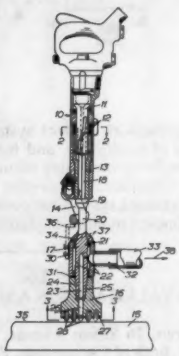
A method is disclosed for drilling holes, or cutting of rock or glass with a corpuscular beam, of electrons or ions of high energy density, typically exceeding about 10^6 watts per square centimeter. The beam is projected into the atmosphere from the chamber in which it is generated. The surface being impinged by the beam may advantageously be under water. The particles of the beam may also have very high energy (accelerating voltage 1 million to 100 million volts) to produce a blasting effect under the surface of the material being disrupted.

3,589,352

STONE-WORKING TOOL

Osten Carlsson, and Kjell Ake Sonnbrink, both of Nacka, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 25, 1968, Ser. No. 778,597
Claims priority, application Sweden, Dec. 4, 1967, 16595/67
Int. Cl. B28d *1/22;* **B25d** *11/00;* **E21c** *7/00*
U.S. Cl. 125—6 **5 Claims**



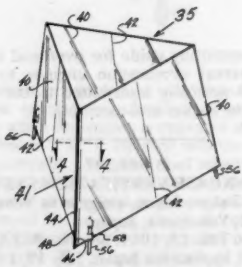
In a stone-working tool of the dressing hammer type there is supported a swivel member above the hammerhead sealingly and rotatably around the stem of the tool. The swivel member is connected to a source of vacuum. Suction passage means extend between the front face of the hammerhead and apertures in the stem within the swivel member whereby stone dust generated by the hammerhead during work is removed via said passage means and swivel member.

3,589,353

POCKET SIZE CAMP FIRE GENERATING KIT

Duane C. Sanders, 5999 Eucalyptus Drive, Highland, Calif.

Continuation of application Ser. No. 649,405, June 5, 1967, now abandoned. This application Jan. 19, 1970, Ser. No. 4,141
Int. Cl. F24c *1/16*
U.S. Cl. 126—9A **1 Claim**



A small device comprising a truncated pyramidal wall of very thin sheet fire resistant material, such as aluminum, the

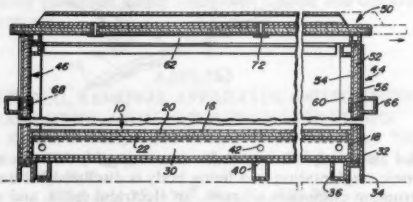
ends of which are united and the entire device bent into folds forming a small, flat, pocket-size package adapted to be conveniently carried by hunters, hikers, skiers and soldiers so that when an emergency is faced requiring the building of a camp fire, said device can be readily unfolded into the form of a small truncated pyramid capable of shielding flammable means provided with said device for generating a fire within said device, the device having means for permitting a draft of air from beneath against the flame generating material within said device.

3,589,354

HEAT-RETAINING SUPPORT

Sidney E. Cross, 416 East Mable St., Tucson, Ariz.

Filed Aug. 5, 1969, Ser. No. 847,660
Int. Cl. A47g *23/04*
U.S. Cl. 126—275 R **18 Claims**



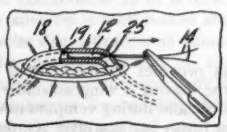
A storage rack comprising either an open platform or an enclosed platform for receiving and maintaining the temperature of precooked foods. The platform is formed of multiple layers, including a heat-insulating asbestos layer and an enlarged internal airflow space communicated with the exterior by underlying air tubes maintained above the support surface by a pair of depending legs. The covered platform includes surrounding asbestos-lined walls and a removable insulated cover.

3,589,355

METHOD FOR ACHIEVING REVERSIBLE MALE STERILIZATION

Hee Young Lee, Department of Urology, College of Medicine, Seoul National University, Seoul, South Korea

Filed Sept. 12, 1969, Ser. No. 857,456
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 **8 Claims**



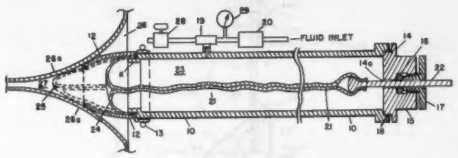
A method for obtaining reversible male sterilization by occlusion of the vas deferens to block passage of the sperm produced in the testes. A portion of the vas deferens is exposed by a high midscrotal incision for the insertion of an intravasal plug. The plug has a filiform thread attached to one of its ends and is introduced into the vas by a straight needle from the testicular side of the epididymal side of the vas with the filiform threads allowed to extend through the wall of the vas at the epididymal side. The filiform thread is then tied around the vas at the epididymal side in order to hold the intravasal plug in place thereby creating a mechanical obstruction to the passage of the sperm.

3,589,356

METHOD FOR EVERTING AND EXTRAVERTING FLEXIBLE TUBING INTO A BODY CAVITY

Daniel Silverman, 5969 South Birmingham, Tulsa, Okla.

Continuation of application Ser. No. 499,292, Oct. 21, 1965, now abandoned. This application Sept. 4, 1969, Ser. No. 855,430
Int. Cl. A61b *6/00*; **A61m** *31/00*
U.S. Cl. 128—1.2 **20 Claims**



A system and method for lining an internal body cavity with thin-walled flexible tubing is described. One end of the tubing is closed and the other is sealed to a fluid pressure casing. The closed end of the tubing is initially disposed within the casing and a tension member passing through the casing is fixed to the reentrant tubing end. Instrumentation, radiation sources, etc. are transported by the tension member as the closed end everts through the tubing within the cavity.

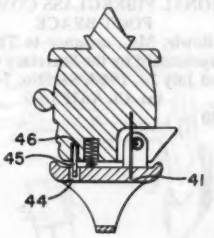
The everted tubing is retained within the cavity for a finite time and the initially closed end of the everted tubing may be opened. It is also disclosed that the tubing may be of assimilable material and/or have a coating which affects, or is affected by, the cavity walls or fluids. The tubing is also described as a vehicle for retrieving cavity samples. Embodiments of suitable apparatus are described.

3,589,357

NOVELTY FINGER-PUNCTURING DEVICE

James B. Mabry, Wellington Road, Route 4, Box 438A, Burlington, N.C.

Filed Nov. 13, 1968, Ser. No. 775,278
Int. Cl. A61b *10/00*, *17/34*
U.S. Cl. 128—2 **3 Claims**



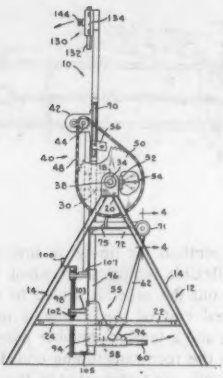
A novelty finger-puncturing device to obtain blood from children for analysis in which a grotesque figure has a finger-receiving cavity with the head of the figure having a finger-puncturing blade in juxtaposition to the finger-receiving cavity with the head of the figure being pivotally mounted to the body whereby upon subjecting the pivotal head to a force the finger-puncturing blade will penetrate the finger for a predetermined depth to obtain a blood sample after which the blade may be removed and the novelty finger-puncturing device may be given to the child as a toy.

3,589,358

METHOD AND APPARATUS FOR TREATING BACK AND NECK SYNDROMES IN HUMANS

Joseph J. Megal, 3443 North Menamonee River Parkway, Milwaukee, Wis.

Continuation-in-part of application Ser. No. 513,149, Dec. 9, 1965. This application May 24, 1968, Ser. No. 744,238
Int. Cl. A61f 5/00
U.S. Cl. 128—71 16 Claims



Apparatus for treating back and neck ailments including a frame having a body support member or table pivotally mounted thereon. The table member has a foot-anchoring mechanism mounted thereon and a drive means for pivoting the table on the frame. The patient is placed on the table in either a horizontal or vertical position and his feet are anchored to the table. The table is then pivoted by the drive means to gradually place the spinal column in traction by gravitational force as the patient's body is tilted to a position wherein the head is moved below and the feet are moved above the horizontal. Relief is usually obtained by tilting the patient to about 30°—45° below the horizontal. The patient is held in the tilted position for about 6 minutes and then returned to an upright or horizontal position for about 1 minute. This procedure is repeated approximately 4 times per individual treatment.

3,589,359

UNIDIRECTIONAL FIBERGLASS COMPOSITE DROP-FOOT BRACE

James T. Hill, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed July 24, 1968, Ser. No. 747,316
Int. Cl. A61f 3/00
U.S. Cl. 128—80 2 Claims

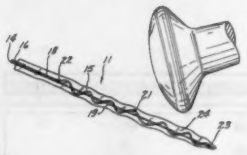
This invention relates to a novel foot brace constructed of unidirectional fiberglass reinforced with epoxy resin. The brace is designed of light flexible plastic and includes two embodiments. The first is a bilateral drop-foot brace consisting of two fiberglass-epoxy rods disposed on each side of the wearer's leg, and extending from a calf band to shoe adapters. The second is a fiberglass-epoxy resin posterior, unibar, drop-foot brace having a contoured brace rod extending from a calf band to a single shoe connection.

3,589,360

ELECTRICAL CABLE FOR CHRONIC IMPLANTATION WITHIN A LIVING BODY

John C. Sinclair, Storm Lake, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 612,557, Jan. 30, 1967, Pat. No. 3,466,742.
Filed May 14, 1969, Ser. No. 824,446
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05F 3 Claims



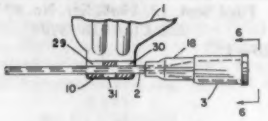
An electrical instrument for measuring blood velocity for chronic implantation in a living body is disclosed herein. The instrument comprises a probe, an electrical cable, and a skin connector. The cable comprises a pair of coiled and insulated platinum alloy wires covered by a flexible electrically insulated material innocuous to animal tissue. The probe comprises a miniature thermistor electrically connected between the common ends of the wires and is also covered with the same electrically insulated material.

3,589,361

INTRAVENOUS CATHETER UNIT WITH FLEXIBLE WING SUPPORT AND INSERTER MEANS

Douglas A. Loper, Los Angeles, Calif., and Dean R. Katerndahl, Wheaton, La., assignors to Abbott Laboratories, North Chicago, Ill.

Filed June 10, 1968, Ser. No. 735,923
Int. Cl. A61m 5/00
U.S. Cl. 128—214.4 7 Claims



This invention provides an intravenous catheter, of the needle-inside type, having a wing assembly serving to guide the catheter and needle during venipuncture and adapted to hold the catheter firmly in place after venipuncture.

3,589,362

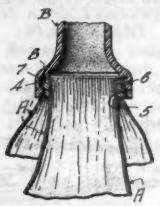
DISPOSABLE SYRINGE

Paul A. Zamarra, Lake Road, Far Hills, N.J.

Filed Nov. 5, 1968, Ser. No. 773,455
Int. Cl. A61m 3/00
U.S. Cl. 128—224 2 Claims

A spray nozzle has spray openings at one end and a flange at its other end, and a bag has folded or pleated portions of its thin plastic wall at the mouth of the bag or around a hole in said wall which has a thickness of the order of from 0.00125 to 0.005 of an inch. Said pleated portions are secured to said flange with a liquidtight connection either by a weld or by a clamping ring which may be either inside or

outside the bag, grips said pleated portions between itself and said flange and by snap spring or screw action is quickly attachable to and detachable from said flange which may be



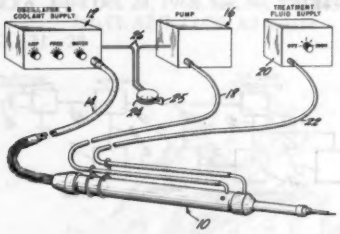
either inside or outside the bag, so that the syringe can be compactly packaged, easily assembled for use and discarded after one use.

3,589,363

MATERIAL REMOVAL APPARATUS AND METHOD EMPLOYING HIGH FREQUENCY VIBRATIONS

Anton Banko, Brooklyn, and Charles D. Kelman, New York, both of, N.Y., assignors to Cavitron Corporation, Long Island City, N.Y.

Filed July 25, 1967, Ser. No. 655,790
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **16 Claims**



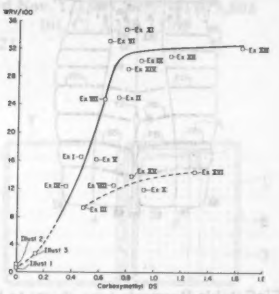
An instrument for breaking apart and removal of unwanted material, especially suitable for surgical operations such cataract removal, including a handheld instrument having an operative tip vibrating at a frequency in the ultrasonic range with an amplitude controllable up to several thousandths of an inch. The operative tip is itself hollow and is in turn surrounded by a tubular sleeve to form an annular passage. The handpiece includes transducer means for converting a high frequency alternating current into mechanical vibrations and an impedance transformer for coupling these vibrations to the operative tips. Connections are also provided on the handpiece to a source of treatment fluid and a pump. The treatment fluid may be coupled to either the hollow interior of the tool or the surrounding annular passage, while the pump is coupled to the other. During use, the vibration of the operative tip against the tissue to be removed causes the latter to break apart into small particles which are then dispersed in the fluid flowing over the operative region. Concurrently, the pump withdraws the suspension of the tissue particles in the fluid from the operative site. The fluid flow must be regulated so as to control the pressure within limits at the operative site. The instrument is thus suitable for removing tissue from an enclosed area whereby the opening to permit access to the tissue to be removed need only be large enough to admit the tip of the operative tool.

3,589,364

BIBULOUS CELLULOSIC FIBERS

Walter Lee Dean, and George Nathan Ferguson, both of Memphis, Tenn., assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 713,143, Apr. 14, 1968, now abandoned. This application Sept. 13, 1968, Ser. No. 767,035
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **10 Claims**



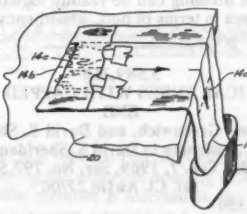
Bibulous cellulosic fibers for use in fibrous structures having an inherently absorptive function, for example surgical dressings, surgical sponges filters, catamenial napkins, tampons and diapers, which bibulous cellulosic fibers, and fibrous structures containing said bibulous fibers in effective amounts, are characterized by greatly improved absorbency for and retention of aqueous solutions, including physiological solutions. The bibulous cellulosic fibers are substantially water-insoluble, wet cross-linked fibrous salts of carboxymethyl cellulose having a sufficiently high degree of carboxymethyl substitution to insure water solubility in the absence of cross-linking. The bibulous cellulosic fibers are produced under conditions which preserve the fibrous form of the cellulose fiber raw material.

3,589,365

UNDERBUTTOCKS DRAPE

Virginia M. Sejman, Greenwood, S.C., assignor to Parke, Davis & Company, Detroit, Mich.

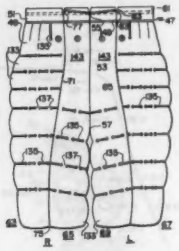
Filed Aug. 28, 1969, Ser. No. 853,875
Int. Cl. A61b *19/00*
U.S. Cl. 128—292 **6 Claims**



An underbuttocks drape is provided having a main panel laminated with or adhered to an overlying fluid-impervious drain panel on one surface and a fluid-impervious slide panel on the reverse surface. The slide panel extends from the back surface around the top edge or leading edge of the main panel and reinforces the leading edge adjacent a hand-receiving cuff so that the assembled drape can be manipulated and slid under the patient supported on an operating table.

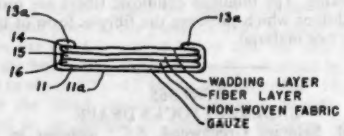
The slide panel and drain panel serve to stabilize and reinforce the main panel as the drape is being placed into position. The drain panel is adapted to be extended to and hung over the edge of the table into a fluid-receiving container.

3,589,366
REDUCING SHORTS
Jack Vincent Feather, Oakland, Calif., assignor to Biophysical Research & Development Corporation
Continuation-in-part of application Ser. No. 887,227, Dec. 22, 1969, now abandoned. This application Dec. 2, 1970, Ser. No. 94,442
Int. Cl. A61f 7/00
U.S. Cl. 128—293 6 Claims



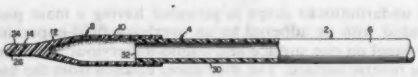
A pair of inflatable Bermuda-type shorts to be worn for exercising and weight reducing.

3,589,367
SURGICAL DRESSING
James W. Sease, Greenwood, S.C., assignor to Parke, Davis & Company, Detroit, Mich.
Filed July 7, 1969, Ser. No. 839,274
Int. Cl. A61f 13/00
U.S. Cl. 128—296 7 Claims



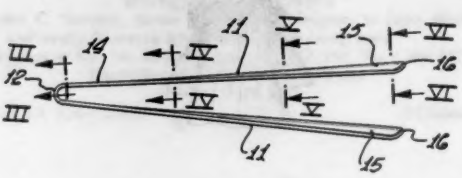
A surgical dressing is provided for direct contact with the wound. The dressing is well suited for placing on the healing area since like surgical gauze it is substantially free from the tendency to deposit loose fibers in the wound site. The construction of the dressing can be readily varied to accomplish selected purposes in terms of bulk, absorbency, feel, etc.

3,589,368
POSTSURGICAL TUBES WITH CAPPED PROXIMAL END
Isaac S. Jackson, Greenwich, and David S. Sheridan, Argyle, both of, N.Y., assignors to David S. Sheridan, Argyle, N.Y.
Filed Feb. 7, 1969, Ser. No. 797,512
Int. Cl. A61m 27/00
U.S. Cl. 128—350 6 Claims



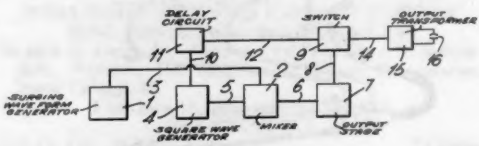
Thoracic catheters and similar postsurgical drainage tubes are made with a proximal end unit which forms an end closure to maintain sterile conditions and to provide forceps grasping means during patient insertion procedures. Following placement in the patient, the closed tip of the proximal end is cut off to permit fluid flow through the tube.

3,589,369
FORCEP CONSTRUCTION
Girts W. Alksnis, La Habra Heights, Calif., assignor to Resiflex Laboratory, Corina, Calif.
Filed Feb. 26, 1969, Ser. No. 802,444
Int. Cl. A61b 17/28, 17/30; B25b 9/02
U.S. Cl. 128—354 2 Claims



A one piece integral forcep construction including spaced-apart forcep arms of V cross section faced in the same direction for pressing towards each other into nested relation and for commencing initial pressure contact at corresponding apices of end portions of the nested arms and progressively increasing pressure area contact as the nested arms are brought together.

3,589,370
ELECTRONIC MUSCLE STIMULATOR
Michael McDonald, Kent, England, assignor to Medical Biological Instrumentation Limited, Kent, England
Filed June 6, 1968, Ser. No. 734,975
Claims priority, application Great Britain, June 9, 1967, 26803/67
Int. Cl. A61n 1/36
U.S. Cl. 128—422 6 Claims



An electric circuit arrangement for an electric muscle stimulator comprising a surging waveform generator, a pulse generator of higher frequency than the surging waveform generator, and a gating circuit connected to the surging waveform generator and the pulse generator and from which bursts of unidirectional pulses are obtained, the repetition frequency of the bursts being that of the surging waveform generator. A transformer has at least one primary winding and at least one secondary winding, the latter being connected to an electric muscle stimulator, and each burst of pulses is applied to the primary winding so that each successive pulse in each burst is an antiphase to its immediately preceding pulse thereby producing bursts of bidirectional pulses in the secondary winding.

3,589,371
CIGAR HOLDER
Leo Conrad Laporte, Montreal, Quebec, Canada, assignor to Imperial Tobacco Company of Canada, Limited, Montreal, Quebec, Canada
Continuation-in-part of application Ser. No. 539,657, Apr. 4, 1966, now Patent No. 3,483,872. This application Sept. 16, 1969, Ser. No. 858,518
Int. Cl. A24f 07/00, 13/00
U.S. Cl. 131—12 4 Claims

A molded polyolefin flexible cigar tip having a flavoring agent, such as a sweetening agent, coffee flavor, etc., incorporated therein which is adapted to discharge continuously into the mouth when the tip is held between the teeth. The

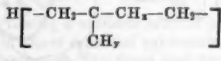
polyolefin utilized has a density in the range of 0.90 to 1.93 and a melt index in the range of 18 to 29.

3,589,372
TOBACCO COMPOSITION ON THE LIKE INCORPORATING A POLYISO-PRENOID ALCOHOL FLAVORSANT

Ernst T. Theimer, Rumson, N.J., assignor to International Flavors of Fragrances Inc., New York, N.Y.

Division of Ser. No. 433,174, Feb. 16, 1965, Pat. No. 3,542,677.
Filed Jan. 14, 1970, Ser. No. 7,331
1970, Ser. No. 7,331
Int. Cl. A24b *15/04*
U.S. Cl. 131—17 4 Claims

Tobacco products having improved flavor and smoking characteristics comprising tobacco and at least one polyisoprenoid hydrocarbon with optional polyisoprenoid esters and/or alcohols, the effective polyisoprenoid hydrocarbon may be represented by the formula.

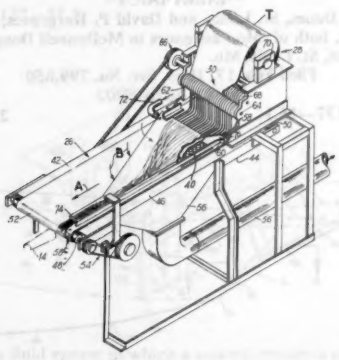


Where n is an integer of from about 4 to 15 inclusive and the dotted line means that, at the position indicated, the bond can be either a single or a double bond, one double bond being present, and where x is an integer of 1 or 2 and y is an integer of 2 or 3, the value of x and y being determined by the position of the double bond.

3,589,373
CIGARETTE MAKING MACHINE

Harry Allison Hooper, Larchmont, N.Y., assignor to AMF Incorporated

Filed Oct. 28, 1968, Ser. No. 770,945
Int. Cl. A24b *11/00*; A24c *5/18*
U.S. Cl. 131—20 6 Claims

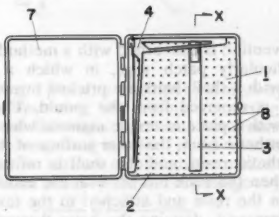


A substantially endless tobacco sheet is fed to a rotary shredder thereby forming a flat sheet of parallel strands. The strands are then fed on to the upper surface of a moving horizontal belt which is apertured adjacent to and parallel with one lateral edge and is otherwise nonporous. An air jet is directed horizontally across the belt and the strand stream from one edge of the belt toward the apertured side edge. A suction system including ducts and a porous support for the apertured portion of the belt is arranged to draw air which traverses the strand stream horizontally and transversely thereof, so that the strands are moved to a position on the belt which overlies the apertures under the influence of the transverse airflow thereover, the strands being arranged in a slightly twisted braid during the air-induced lateral movement. A flat cover is placed above the belt and the strand stream in spaced relation thereto. The discharge nozzle from the air jet is aimed to direct the air flowing therefrom between the cover and the moving belt. A guide is placed on the belt-supporting frame adjacent to the apertured side edge of the belt to limit the lateral movement of the strand stream. The braid is advanced to a conventional rod wrapper, and cutter thereby providing finished cigarettes or the like.

3,589,374
METHOD OF AND CONTAINER FOR TREATING TOBACCO TO REDUCE ALKALOID AND TAR CONTENT THEREOF

Tomizo Aoki, 19 Juso Higashinocho 3 Chome, Higashiyodogawaku, Osaka-shi, and Nagayoshi Nishida, 26 Hashimoto Okunocho, Yawatacho, Kyoto-fu, both of, Japan

Filed Nov. 1, 1967, Ser. No. 679,805
Int. Cl. A24b *15/02*
U.S. Cl. 131—121 5 Claims

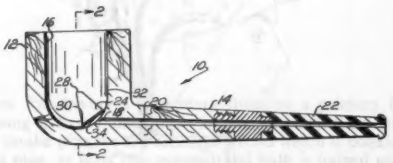


A method of reducing the nicotine and tar content of the smoke of tobacco consists of exposing said tobacco to weak radiation of 50 to 200 c.p.m./cm.^{2} from a radioactive material. The tobacco to be irradiated is located in a special container which is provided with a perforated plate or sheet form of radioactive material. The radioactive material can, if desired, be coated onto the surface of the plate.

3,589,375
PIPE BOWL DEVICE

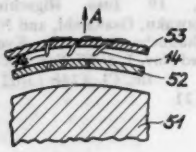
Harold B. Pekrul, 9243 Music St., Novelty, Ohio

Filed Aug. 1, 1969, Ser. No. 846,734
Int. Cl. A24f *5/08*
U.S. Cl. 131—205 3 Claims



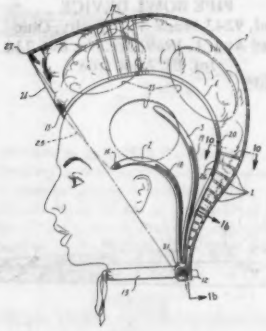
A device for use in a tobacco pipe to prevent moisture and tobacco from entering the pipestem opening includes a baffle member. The baffle member is inserted in the bowl of the pipe to cover the pipestem opening and cooperate with the internal wall and the bottom of the bowl of the pipe to form a passageway for directing smoke from burning tobacco in the bowl of the pipe to the pipestem opening. The passageway has an inlet portion located adjacent the bottom of the pipe bowl and has a substantial cross-sectional area which is not readily plugged with moist tobacco. The baffle member is generally triangular, located in the bowl of the pipe and has a configuration which retards the entry of moisture and tobacco into the pipestem opening. Two corners of the baffle member have pointed ends adapted to enter the lower portion of the bowl wall while the third corner of the member is located adjacent to the bowl bottom so that the member covers the outlet opening for smoke from the bowl, and is spaced upwardly therefrom.

3,589,376
METHOD OF MAKING WIGS
Erwin Kohler, Hasselmannsweg 5, Ahrensburg near Hamburg, Germany
Filed Apr. 26, 1968, Ser. No. 724,334
Claims priority, application Germany, Apr. 29, 1967, 62,189
Int. Cl. A41g 3/00
U.S. Cl. 132—5 13 Claims



The invention is concerned with a method of making wigs, and particularly patch wigs, in which a male mould is covered with a shell, hairs are pricked through the shell, and the shell is removed from the mould. The mould is then covered with a piece of textile material which is impregnated with a synthetic resin, the inner surface of the shell is coated with synthetic resin, and the shell is refitted to the mould again. When the resin has set with the ends of the hairs embedded in the resin and attached to the textile material the shell is removed, drawing the hairs through the shell. The wig, consisting of the piece of textile material with the hairs attached is finally removed from the mould.

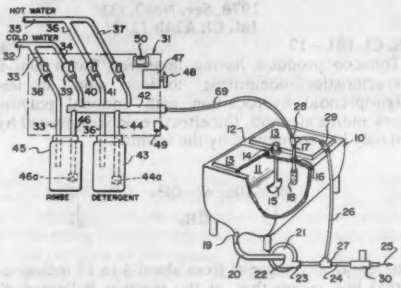
3,589,377
HAIR SET PROTECTOR
Mabel S. Curtis, 26529 Gading Road, Hayward, Calif.
Filed Apr. 23, 1970, Ser. No. 31,168
Int. Cl. A45d 8/00
U.S. Cl. 132—46 4 Claims



A hair set protector with a foundation made of tinelike fingers which conformably fit the base and rear of the wearer's skull. A protective covering surface is held in place by attaching it to the foundation by a plurality of structural support members. The hair set itself is held in place by the structural support members.

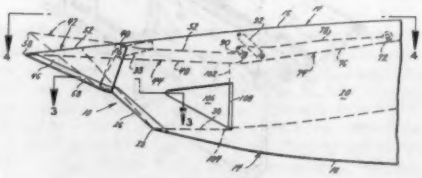
3,589,378
RECEPTACLE CLEANING APPARATUS
Donald F. Swanson, and Wynn G. Winkler, both of St. Paul, Minn., assignors to whirlpool Corporation
Filed Nov. 7, 1968, Ser. No. 774,048
Int. Cl. B08b 3/02, 9/08
U.S. Cl. 134—58 9 Claims

Apparatus for cleaning a receptacle such as a bulk milk tank having an entrance and an exit comprising means for flowing a prerinse liquid such as water through the receptacle without substantial recirculation for a selected time to flush out foreign material, means for thereafter circulating a quantity of rinse liquid such as an additional amount of water through a circuit including the receptacle by way of its entrance and exit for a selected time for a further rinsing action, means for removing this latter liquid at the end of its selected time, means for thereupon circulating a quantity of detergent liquid such as aqueous detergent solution through the circuit and means for removing this detergent liquid. In



the preferred structure these various cleaning means are operated automatically at the proper time for the preselected time. Also, in a further preferred structure, there is provided means for circulating a preselected quantity of cleaning rinse solution such as a weak aqueous acid solution through the receptacle circuit for a selected time subsequent to the removal of the detergent liquid to produce a final removal of foreign material from the interior of the receptacle.

3,589,379
INLET DUCT
James J. Daues, St. Louis, and David P. Hargraves, Webster Groves, both of, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Feb. 17, 1969, Ser. No. 799,650
Int. Cl. F02b 27/02
U.S. Cl. 137—15.1 20 Claims

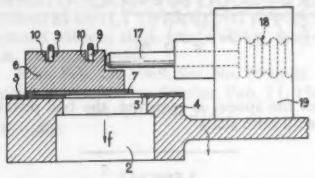


A jet engine inlet duct resembling a duct of the internal compression variety, but having a vent opening in one of its sidewalls for allowing spillage of a sufficient amount of air to permit the establishment of a shock wave system in the duct as the aircraft accelerates to supersonic speeds. The shock wave system includes a normal shock wave which passes downstream in the duct to a throat area therein, and the vent further extends across the region of the normal shock to afford spillage of a limited amount of air from the subsonic region behind the normal shock wave. The duct also includes a rocking ramp pivoted intermediate its ends about an axis transverse to the channel through the duct. The leading edge of the ramp is located forwardly of the channel while its trailing end is in the channel, and accordingly the capture area and throat area of the duct are changed as the inclination of the ramp changes. A sideplate extends downwardly from the ramp so that the inlet functions similar to an internal compression inlet.

3,589,380
ADJUSTABLE JET

Francois Gastinne, Paris, France, assignor to Automobiles Peugeot and Regie Nationale Des Usines Renault, Paris, France

Filed Jan. 10, 1969, Ser. No. 790,412
Claims priority, application France, Jan. 29, 1968, 137,750
Int. Cl. F16k 3/16
U.S. Cl. 137—81 6 Claims

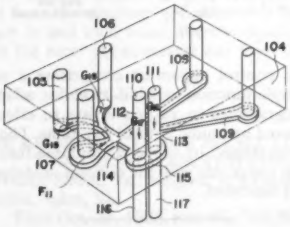


Adjustable jet having a variable section jet passage defined by a fixed wall of sheet material substantially 0.1—0.2 mm. thick and a movable wall. The fixed wall has an orifice which is masked to a varying extent by the movable wall which is integral with a movable shoe. Magnitude-measuring means are provided for controlling the movement of the shoe and elastically yieldable means guide the shoe and maintain the shoe against the fixed wall and against the magnitude-measuring means.

3,589,381
PURE FLUID SYSTEM

Mititaka Yamamoto, Kyoto-fu; Ryoichi Yoshida, Aichi-Ken; Genzo Uekusa, Osaka-fu, and Tomoomi Kobayasi, Kyoto-fu, all of, Japan, assignors to Tateisi Electronics, Kyoto-fu, Japan

Filed Oct. 16, 1968, Ser. No. 768,133
Claims priority, application Japan, Oct. 20, 1967, 42/67587
Int. Cl. F15c 1/04
U.S. Cl. 137—81.5 6 Claims



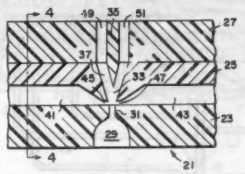
A pure fluid system in which a control stream is capable of causing a mainstream of continuous flow of a pressurized fluid to deflect; the control stream is thereby so coordinated to the mainstream that no direct contact exists between the control stream and the mainstream but instead the control stream is formed as individual stream separated from the mainstream and flowing past the side of the mainstream to merely produce a change in pressure on the lateral side of the mainstream, thereby causing the mainstream to carry out a deflection.

3,589,382
FLUIDICS

John P. Glass, c/o Cava Industries 79 LaGrange Ave, Essington, Pa.

Filed May 28, 1969, Ser. No. 828,643
Int. Cl. F15c 1/06
U.S. Cl. 137—81.5 3 Claims

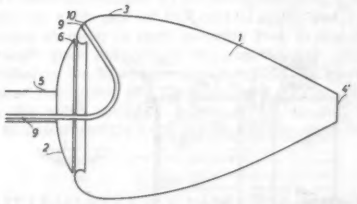
A fluidic plate assembly comprising a series of abutting plates including a power nozzle plate having an input chamber which narrows down into a power nozzle, a control passageway plate having an interaction chamber with an opening that registers with the power nozzle and having a plurality of control passageways with nozzles that open into the interaction chamber, a splitter plate having a splitter which extends into the interaction chamber to form an output ring and having a plurality of output passageways that register with the output ring, and means connecting adjacent plates together and forming a tight seal. Apparatus for making fluidic plates comprising standard mold units for making a series of plates in various combinations including power nozzle plates, splitter plates, and control passageway plates.



3,589,383
DEVICE FOR DRIVING A FLUID

Michel Garnier, 28 Avenue Montaigne, Paris, France

Filed July 31, 1969, Ser. No. 846,423
Claims priority, application France, Aug. 1, 1968, Apr. 18, 1969, 161,549;6,912,301
Int. Cl. F15d 1/02
U.S. Cl. 137—81.5 3 Claims



Device for driving a secondary fluid by a primary fluid comprising a first intake pipe for the primary fluid and a second intake pipe for the secondary fluid which is coaxial to the first pipe, at least one symmetrical bulb is lodged coaxially in the second pipe, with the downward end of the first pipe providing a slit between it and the upward portion of the bulb for the flowing of the primary fluid therethrough whereby the primary fluid issues from the slit in a path substantially tangential to the outer profile of the bulb from upward to downward, the downward end of the bulb being truncated.

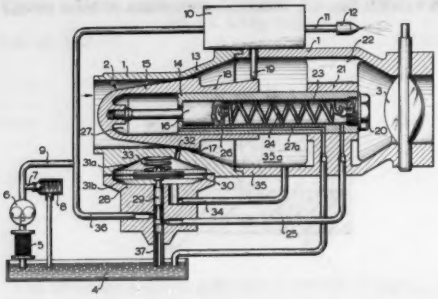
3,589,384
FLOW RATE-RESPONSIVE FUEL MIXTURE CONTROL DEVICE WITH SERVOMECHANISM

Konrad Eckert, Stuttgart-Bad, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Dec. 10, 1968, Ser. No. 782,689
Claims priority, application Germany, Jan. 5, 1968, P 16 01 360.8
Int. Cl. F02m 7/22
U.S. Cl. 137—98 9 Claims

In the air suction tube of a fuel injection system associated with an internal combustion engine, there is displaceably held a control member which regulates a flow passage sec-

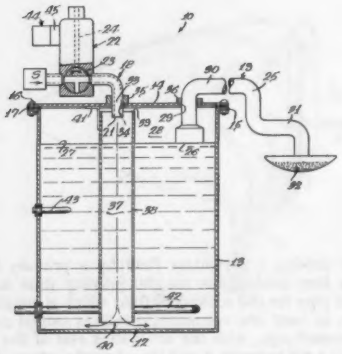
tion for the air and meters the fuel in response to the change in the flow rate of air in the suction tube. The change in the static air pressure due to the change in the flow rate is utilized as an input force to control a servocircuit whose relatively large output force is used directly to displace said control member.



ERRATUM

For Class 137—119 see:
Patent No. 3,589,404

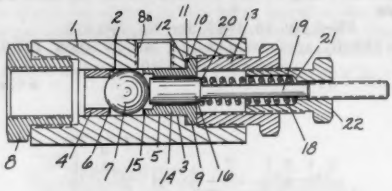
3,589,385
VENTED HOT WATER SUPPLY APPARATUS
Charles J. Vitous, Berwyn, Ill., assignor to Cory Corporation
Filed Feb. 7, 1969, Ser. No. 797,592
Int. Cl. A47j *31/46*
U.S. Cl. 137—145 **13 Claims**



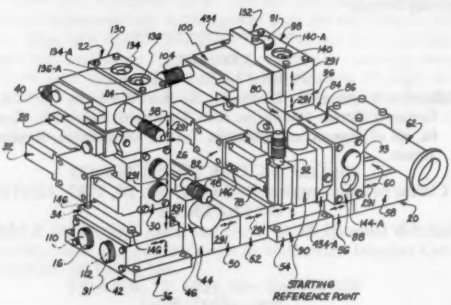
A hot water supply apparatus wherein cold water is introduced into a closed tank to displace hot water from the tank through a siphon outlet. A three-way valve is provided for controlling the delivery of the cold water to the tank and for automatically venting the tank during the siphoning operation at the conclusion of the cold water delivery.

3,589,386
PILOT VALVE
Walter R. Chapman, Erie, and Willis R. Wolfe, Girard, both of, Pa., assignors to Air-Con, Incorporated, Lake City, Pa.
Filed Sept. 2, 1969, Ser. No. 854,441
Int. Cl. F16k *15/04*
U.S. Cl. 137—269 **8 Claims**

A pressure-operated valve having a ball piston means between opposed seats in which a spacer positions one of the seats so that the cumulative spacing between the piston and the seats is equal to the thickness of the spacer. In other words, when the spacer is removed, the ball piston means is in contact with both seats.

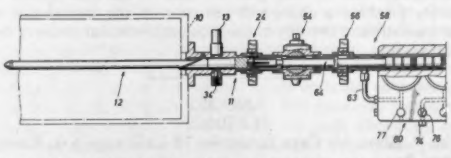


3,589,387
INTEGRATED MANIFOLD CIRCUITS AND METHOD OF ASSEMBLY
Robert E. Raymond, Zanesville, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.
Filed Aug. 22, 1969, Ser. No. 852,231
Int. Cl. F16k *11/10*
U.S. Cl. 137—271 **39 Claims**



A hydraulic control apparatus comprising a plurality of standard multiple-function conduit modules adapted to be selectively programmed in various arrays to effect substantially any required hydraulic control functions. The apparatus is further characterized by universal multiple-function valve modules which cooperate with the conduit modules in effecting the control functions.

3,589,388
INJECTOR NOZZLE RETRIEVER AND INSERTION APPARATUS
Bryan L. Haneline, Jr., 5739 Cerritos St., Houston, Tex.
Filed Mar. 30, 1970, Ser. No. 23,545
Int. Cl. F16k *43/00*; B23p *19/04*; B08b *3/02*
U.S. Cl. 137—315 **10 Claims**



A problem exists in cleaning and servicing injector nozzles which normally extend into a high pressure atmosphere. Inasmuch as they cannot simply be removed from their point of installation, a means and system are needed for removal. The present invention incorporates a housing which surrounds a pressure-driven retriever which has a forward grappling

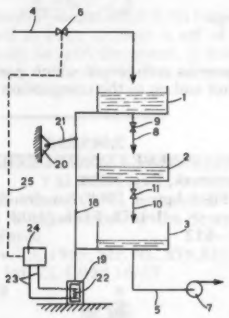
means, the entirety of the retriever screwing onto the rear of an injector nozzle assembly, the assembly being supported by a flanged structure, the retriever moving forwardly to engage and grasp the assembly and pull it back into the retriever housing, thereafter permitting closure of a valve to plug the opening left on removal of the assembly.

3,589,389

METHOD AND SYSTEM FOR MAINTAINING EQUAL AND CONTINUOUS FLOWS OF LIQUID TO AND FROM INTERMITTENTLY OPERATING APPARATUS

Vilgot Raymond Nilsson, Hagersten, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Feb. 17, 1969, Ser. No. 799,686
Claims priority, application Sweden, Feb. 21, 1968, 2231
Int. Cl. F16r *31/12*
U.S. Cl. 137—403 **4 Claims**



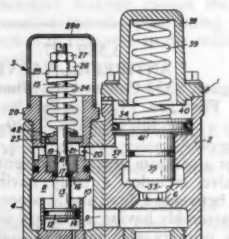
A receiving container intermittently supplies liquid to a unit, and a discharging container collects and discharges liquid intermittently leaving this unit. Means are provided for adding values corresponding to the liquid quantities in the respective containers, and possibly in the unit also, to obtain a total value dependent upon the sum of these quantities; and the flow of liquid supplied to the receiving container or discharged from the discharging container is regulated to arrest changes in said total value, thereby equalizing the flows of liquid to the receiving container and from the discharging container.

3,589,390

PRESSURE RELIEF VALVE FOR DIESEL LOCOMOTIVE COMPRESSED AIR SYSTEMS

Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corporation, Salen, Va.

Filed Oct. 23, 1968, Ser. No. 769,901
Int. Cl. F16k *17/10*
U.S. Cl. 137—489.5 **7 Claims**



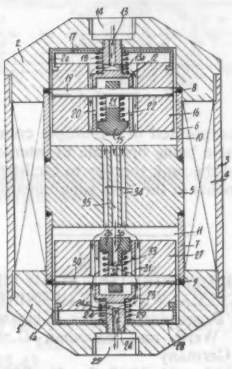
A pressure relief valve combining main and pilot valves, the main valve having as a valve member a differential piston with a small head exposed and a large head normally unexposed to line pressure and the pilot valve being adjustable to open under a predetermined line pressure for substantially statically applying pressure to the large head of an shifting the main valve member to open position without producing flutter.

3,589,391

ELECTRICALLY OPERATED FLUID FLOW CONTROL VALVE DEVICE

Ettore Pagliaro, Via Uruguay 14, Milan, Italy

Filed May 6, 1969, Ser. No. 822,196
Claims priority, application Italy, May 6, 1968, 834468
Int. Cl. F16k *17/18*
U.S. Cl. 137—493.8 **8 Claims**



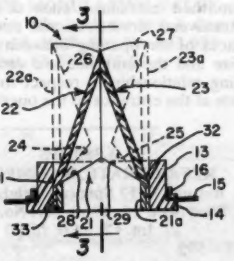
An electrically operated valve device for controlling fluid flow therethrough comprising a casing which houses a central stationary core surrounded by an energizing coil, a movable slave core on each side of the central core, and a spring-loaded valve member in each movable core to control fluid flow through axial passages in the central core. Deflectors are provided in the movable cores to shield the valve members against fluid flow, and fluid pressure may be employed to assist the valve members whose spring loading can be selected to determine the control effect of the valve device.

3,589,392

SPLIT LEAFLET CHECK VALVE FOR CARDIAC SURGERY AND THE LIKE

Louis C. Meyer, Box 434, Rte. 1, Morrison, Colo.

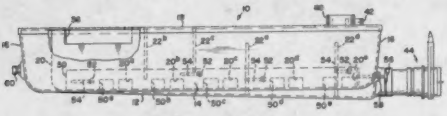
Filed May 5, 1969, Ser. No. 821,808
Int. Cl. F16k *15/14*
U.S. Cl. 137—525.1 **8 Claims**



A check valve for cardiac surgery and the like has a hollow valve body supporting a split leaflet divided into separable portions hinged for swinging movement from the base thereof between a normally closed position and an open position wherein the leaflet forms a continuation of one end of

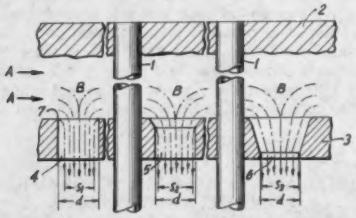
the hollow body. Inturned edges of the separable leaflet portions converging from the body are in a sealed engagement with a seat on the body and terminate in longitudinal edges which are in a sealed engagement to one another in the normally closed position.

3,589,393
SEPTIC TANK CLEANING VALVE
Melvin L. Dieterich, North Olmsted, Ohio, assignor to The Standard Products Company, Cleveland, Ohio
Filed July 15, 1969, Ser. No. 841,870
Int. Cl. C02c 1/28
U.S. Cl. 137—572 8 Claims



A valve is incorporated in a multiple compartment septic tank with the valve being operable to intercommunicate the compartments of the tank thereby to facilitate flushing of all of the compartments of the tank simultaneously with a single source of liquid.

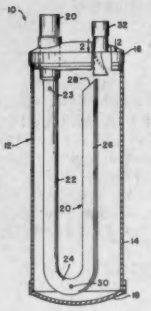
3,589,394
DEVICE FOR DISTRIBUTING FLOW MEDIA OVER SEVERAL PASSAGE OPENINGS
Oskar Wanka, Deggendorf/Danube, Germany, assignor to Deggendorfer Werft und Eisenbau G.m.b.H., Deggendorf/Danube, Germany
Filed Mar. 11, 1969, Ser. No. 806,208
Claims priority, application Germany, Mar. 17, 1969, P 16 75 501.4
Int. Cl. F16l 5/00; B05b 1/16
U.S. Cl. 137—590 12 Claims



A device for distributing and regulating the flow of a fluid medium is formed by a plate member having a plurality of openings for the passage of the fluid medium. At a location spaced from their entrances, each of the openings has a minimum transverse cross-sectional size, however, the opposite surfaces of the opening between the minimum cross-sectional size and the entrance are varied between parallel and diverging relationship in respect to the pressure of the fluid medium at the entrance to the openings.

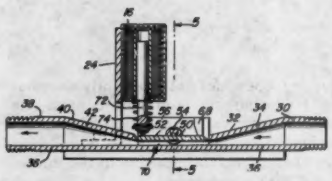
3,589,395
REFRIGERATION COMPONENT
Edward W. Bottum, 9357 Spencer, Brighton, Mich.
Filed Sept. 16, 1968, Ser. No. 759,876
Int. Cl. F17c 13/00
U.S. Cl. 137—592 1 Claim

A suction accumulator is provided for the compressor of a refrigeration system. The accumulator includes a casing having an inlet and an outlet. A U-shaped conduit is provided within the casing. One leg of the conduit extends from a point adjacent the bottom of the casing to the casing outlet. The other leg extends from the casing bottom and terminates in an open end within the casing. A metering opening is provided in the bend of the U-shaped conduit to meter liquid refrigerant into the conduit. The open-ended leg is adapted



to receive gaseous refrigerant which passes through the U-shaped conduit and on to the compressor of the system.

3,589,396
VALVE CONSTRUCTION
Eugene C. Tomczak, Ray, Minn.
Filed Apr. 3, 1969, Ser. No. 813,124
Int. Cl. F16k 11/02
U.S. Cl. 137—612 3 Claims

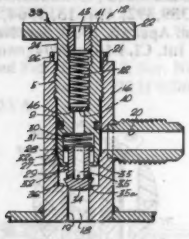


A valve for controlling fluid flow between inlet and outlet ports incorporating a solenoid controlled vane member. During an open condition of the valve, the plane of the vane is maintained in parallel relation to the fluid flow stream between the inlet and outlet ports. Upon selective actuation, by the solenoid, the vane is angularly inclined with respect to the flow stream. The edge of the vane which confronts the inlet port is bevelled to form an enlarged impinging surface upon which the stream from the inlet port may operate in a manner aiding and hastening the rotation of the vane to its pivotally inclined position. In the latter mentioned position, the valve inhibits flow between the ports. A second actuation of the solenoid returns the vane to its original nonimpeding position.

3,589,3[illegible]
ANTIREFILL VALVE
William Wagner, 5333 Collins Ave., Miami Beach, Fla.
Filed Jan. 19, 1970, Ser. No. 3,972
Int. Cl. F16k 35/00
U.S. Cl. 137—614.2 14 Claims

A valve for a pressure vessel to prevent refilling of the vessel. The valve includes a body having a flow through passageway between a first and a second port and a valve component assembly having a primary seat-engaging surface to engage a primary seat in the passageway between the ports. Movement of the assembly to control flow through the valve is by manipulation of an operator. The movement is limited to a predetermined length of displacement of the primary seat-engaging surface from the primary seat. An antirefill sealing member is extendibly connected to the inner end of the valve component assembly and is sized for sealing engagement with a second seat in the passageway. The antirefill sealing member is normally seated when the passageway is closed by the primary seat-engaging member,

but, when the operator has been manipulated so as to move it off the primary seat to open the passageway, the antirefill sealing member is buoyed by pressure in the vessel into an open position so that it does not engage the second seat and

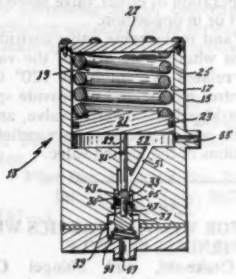


the valve is open; however, when there is no longer sufficient pressure in the vessel to buoy or float it off of the second seat, if efforts are made to refill the vessel, it remains closed blocking the passageway rendering a pressure vessel to which it is secured a single use vessel.

3,589,398
PNEUMATIC PRESSURE REGULATOR REDUNDANT VALVING

August F. Haach, Torrance, Calif., assignor to The United States of America as represented by the Secretary of The United States Air Force

Filed Nov. 13, 1969, Ser. No. 876,421
Int. Cl. G05d *16/10*
U.S. Cl. 137—614.19 **4 Claims**



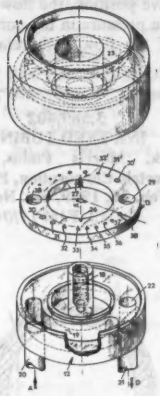
Primary and secondary ball valves are operatively connected to one another in tandem by a compression transmitting member. The primary ball valve provides initial flow control between inlet and outlet ports. Failure of the primary valve because of excessive leakage causes the secondary valve to become operative thereby performing the sealing and flow control function in response to the main regulating pressure control element.

3,589,399
COCK OR VALVE FOR CONTROLLING THE WORKING CONDITIONS OF A GAS HEATING APPARATUS

Roger Vignes, Paris, France, assignor to Gar De France, Paris, France

Filed Dec. 2, 1969, Ser. No. 881,524
Claims priority, application France, Dec. 3, 1968, 176453
Int. Cl. F16k *11/08*
U.S. Cl. 137—625.3 **10 Claims**

The invention relates to a cock for controlling a gas heating apparatus such as a cooker. The cock comprises a body in which is formed a first arcuate groove which communicates with the gas supply conduit, and an opening which communicates with the gas distribution conduit, a disc mounted opposite the said body and in which is formed a second arcuate groove and a washer mounted between the body and the disc and in which are provided calibrated orifices. According to the position of rotation of the cock, a cer-

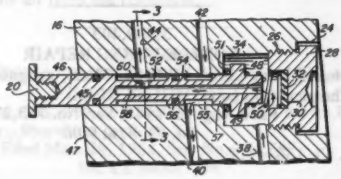


tain number of said orifices interconnect said gas supply conduit to said second gas conduit.

3,589,400
AIR VALVE

Charles D. Bruyn, Rte. 94, Box 27, Vails Gate, N.Y., and James H. Bruyn, 111 Coach Lane, Newburgh, N.Y.

Filed Feb. 28, 1969, Ser. No. 803,328
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.43 **2 Claims**

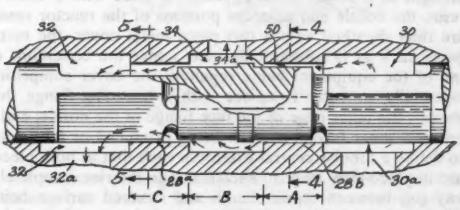


A valve assembly including a cylinder for receiving a valve stem therein. Fluid passages are formed in the valve stem thereby permitting fluid flow in a first direction when the stem is disposed in a first position. When the valve stem is displaced to a second position, the passage formations in the stem cooperate with an enlarged closed end of the cylinder to reverse the fluid flow.

3,589,401
PRESSURE MODULATING VALVE

Ray S. Harding, Racine, Wis., assignor to J. I. Case Company

Filed July 18, 1969, Ser. No. 843,093
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.67 **7 Claims**



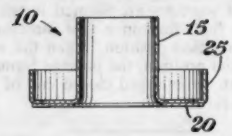
A control valve for controlling the pressure of a fluid to a control port on a valve bore. The valve spool cooperates with

the valve bore to define an axial flow path located between the inlet and return ports of the control valve and which is axially shiftable by moving the valve spool. With the valve spool in an operative position, the flow path bridges the control port so that the pressure in the control port is a function of the position of the flow path relative to the inlet and return ports.

3,589,402
INK FEED TUBING
Wilbert T. Buck, Morris Plains, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 26, 1969, Ser. No. 802,683
Int. Cl. F16l 11/04
U.S. Cl. 138—137 **3 Claims**

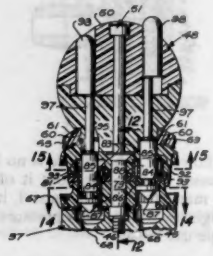
A sealed inking system recording instrument having an ink supplying tube connecting the ink reservoir to the movable recording pen which tube is impervious to air and ink and retains its flexibility at temperature which extend from a temperature well below zero to temperatures of 120° F. and above.

3,589,403
NOZZLE LINING REPAIR
Raymond Burt Chase, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Aug. 16, 1968, Ser. No. 753,276
Int. Cl. F16l 9/00
U.S. Cl. 138—177 **2 Claims**



In a glass or ceramic-lined reactor vessel for use with corrosive contents, to repair damage of glass lining and surface of a nozzle, damaged portions of the nozzle are cleaned and brought to a sound surface; recess is filled with a curable resin; the nozzle and adjacent portions of the reactor vessel are then sheathed with a two piece metal cover, the metal being such as is substantially inert under the conditions of use of the equipment being repaired; the cover comprising essentially an outer facepiece with a returning flange that sheaths the outer edge of the face flange of the nozzle; and a crimped inner facepiece each being produced or fabricated to define a tubular central extension such that as both pieces are in place they mate to sheath nozzle interior completely; any gap between repair sheath and covered surface being filled with a curable resin filler that is inert and insoluble when cured; the nozzle being held securely in place with cooperating inert gasket engaging the crimped interior face as curable resin is cured.

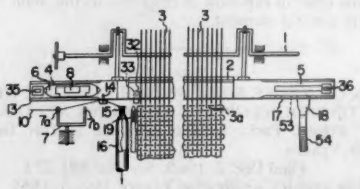
3,589,404
MIXING VALVE AND REPLACEABLE VALVE CARTRIDGE THEREFOR
Lloyd Spencer, 220 Patrician Way, Pasadena, Calif.
Continuation-in-part of application Ser. No. 491,771, Sept. 30, 1965, now abandoned, Continuation-in-part of application Ser. No. 359,392, Apr. 13, 1964, now abandoned. This application Apr. 10, 1969, Ser. No. 814,990
Int. Cl. F16k 11/04
U.S. Cl. 137—119 **21 Claims**



A mixing valve having two parallel valve assemblies including valve inlet seals, valve elements engageable with the inlet seals, sealing diaphragms and one or more common outlet ports all incorporated in a single replaceable valve cartridge secured between a base and a journal ball or journal socket; the assemblies further including cam followers extending through the journal ball or protruding into the journal socket; either the journal socket or ball cooperating with a complementary member having cam areas movable across said cam followers to effect operation of either valve assembly or both assemblies in concert or in opposition.

The mixing valve and replaceable valve cartridge also including modifications wherein the axes of the valve assemblies are angularly related preferably at 120° to improve operation of the control handle and to provide space in the removable valve cartridge for a diverter valve, and the axes of each valve assembly and cam follower are radially offset to minimize the dimensions of the mixing valve.

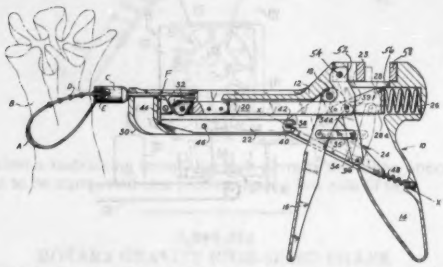
3,589,405
APPARATUS FOR WEAVING FABRICS WITH A PIRNLESS SHUTTLE
Joichi Kitajima, Otake-shi, and Shinpei Chikaraishi, Musashino-shi, Kyoto-to, both of, Japan, assignors to Howa Kogyo Kabushiki Kaisha, Nagoya-shi, Aichi-ken, Japan
Continuation of application Ser. No. 645,248, June 12, 1967, now abandoned. This application July 17, 1969, Ser. No. 847,507
Int. Cl. D03d 47/00
U.S. Cl. 139—126 **5 Claims**



In an apparatus for weaving fabrics with a pirnless shuttle wherein a length of a weft substantially equal to twice the width of the fabric is measured and stored on one side, the first width of the stored length of the weft is pulled out and threaded in a shed by a pirnless shuttle, the second width is stored on the opposite side and is then threaded by the shuttle moving in the opposite direction, the shuttle is provided

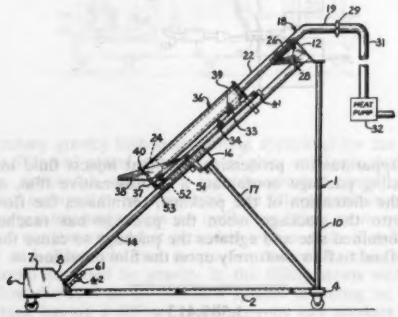
an inclined weft guide groove at one end and the weft is guided to be caught by said inclined weft guide groove.

3,589,406
SHACKLE-TIGHTENING TOOL INCLUDING MEANS FOR DEFORMING AN END OF THE SHACKLE
Sigurd M. Moberg, East Orange, N.J., assignor to E. J. Brooks Company, Newark, N.J.
Filed Feb. 10, 1969, Ser. No. 797,846
Int. Cl. B21f *9/00*
U.S. Cl. 140—93 A 2 Claims



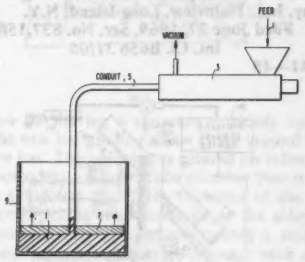
A handtool for tightening a shackle upon an article or articles as, for example, the neck of a bag, for closing the latter, includes means for cutting off an excess end portion of a tightened shackle. The novelty resides in providing the tool with knife-spacing means causing the shackle to be so cut as to leave a tab of predetermined size remaining on the end of the tightened shackle, and also in the inclusion in the tool of means for deforming and/or embossing said tab; the latter means including actuating parts serving also in the tightening of the shackle upon an article or articles.

3,589,407
MEAT MOLD LOADER
Ralph M. Foldenauer, Chicago, Ill., assignor to Bloomer-Fiske, Inc.
Filed Dec. 26, 1968, Ser. No. 787,135
Int. Cl. B65b *1/04*; B67c *3/26*
U.S. Cl. 141—1 9 Claims



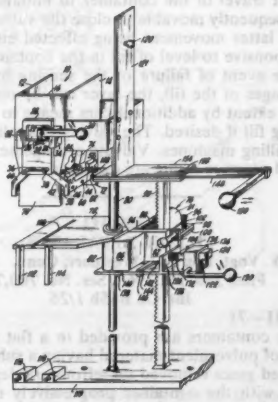
A meat mold loader comprises dual-inclined, mold-filling tubes with stuffing horns at the lower ends thereof. A carriage supports a correspondingly inclined dual meat mold unit and is movable upwardly along the incline to telescope the mold of the unit with the horns and filling tubes and bring the lower ends of the molds coincident with the stuffing horns. The carriage is then lowered along the incline while the molds are being filled. The lower end of the carriage has an abutment for the dual mold and a stand adjacent to the abutment. The filled dual mold is swung upwardly from its inclined position to a vertical position approximately about the abutment as a fulcrum. Upon reaching its vertical position the dual mold becomes supported on the stand preparatory to placing end covers on the molds.

3,589,408
METHOD OF PACKAGING EPOXY SOLDERS
George A. Salensky, Metuchen, N.J., assignor to Union Carbide Corporation, New York, N.Y.
Filed Dec. 30, 1968, Ser. No. 787,954
Int. Cl. B65b *1/04*
U.S. Cl. 141—1 1 Claim



This invention relates to the production of epoxy solders, which are characterized by excellent paint absorption properties, by formulating curable compositions based on cycloaliphatic diepoxides and dimers of fatty acids and deaerating the compositions so formulated. This invention also relates to a method of packaging an epoxy solder by feeding the epoxy solder into a container while concurrently displacing the air from the container.

3,589,409
METHOD AND APPARATUS FOR FORMING A FILAMENT PACKAGE
Gilbert Shaw, P.O. Box 151, Middlebury, and Charles H. Anderson, Jr., Shoreham, both of, Vt.
Filed Mar. 20, 1968, Ser. No. 714,597
Int. Cl. B65b *1/06*
U.S. Cl. 141—10 13 Claims



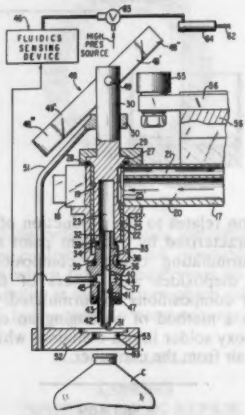
A filament package comprising a closed flexible sack containing cut filament packaged essentially parallel to each other and essentially normal to the length of the sack. In packaging the cut filament within the flexible sack, the filament is fed into an opened end of the sack with the filaments essentially in parallel relationship to each other and essen-

tially normal to the length of the sack while maintaining a movable temporarily closed end in the sack between the permanent ends thereof. The movement of the intermediate temporarily closed end is coordinated with the filament feed so that cut filament controllably moves into and within the sack and into contact with cut filament already properly aligned therein without incident. The package of the invention provides many advantages over conventional brush or brush-type fiber packages in cost, handling and use by, for example, brush or artificial Christmas tree makers.

3,589,410
VALVE ARRANGEMENT FOR CONTAINER FILLING MACHINES

Herman D. Manas, Roslyn Estates, N.Y., assignor to M.R.M. Company, Inc., Plainview, Long Island, N.Y.

Filed June 27, 1969, Ser. No. 837,158
Int. Cl. B65b *31/06*
U.S. Cl. 141—45 **8 Claims**



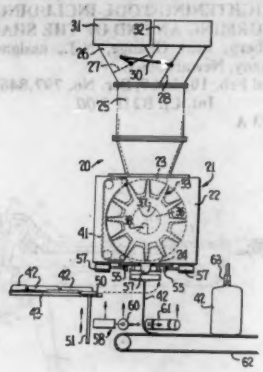
Fluid filling machine with novel control valving movable from closed to open condition when a container is in position to receive the filling fluid, the valving remaining closed if no container is present and in such event permitting bypass return flow of the filling fluid to its source. The valving is operated by a control lever which is movable from an inoperative to operative position by the container that is to be filled. The lever, in turn, in its operative position is moved to valve-open position by engagement of the lever with a cam in the path of travel of the container to initiate filling thereof and is subsequently movable to close the valve at completion of fill, the latter movement being effected either by sensing means responsive to level of fill in the container or a further cam in the event of failure of the sensing means. In intermediate stages of the fill, the lever can be manipulated to a controlled extent by additional cam means to control rate of flow during fill if desired. The valving is applicable to rotary or linear filling machines. Valving arrangements suitable for gravity and pressure filling are disclosed.

3,589,411
FILLING APPARATUS

Clarence W. Vogt, Box 232, Westport, Conn.

Filed Jan. 26, 1968, Ser. No. 700,771
Int. Cl. B65b *1/26*
U.S. Cl. 141—71 **5 Claims**

Flexible containers are provided in a flat state to a filler and units of pulverulent material having a substantial portion of entrained gases removed therefrom are deposited into the container with the container progressively opening as it is being filled whereby, for all practical purposes, only a minimum amount of air may be added to the compacted pulverulent material delivered into the container. Rollers may be provided for engaging opposite surfaces of the container so as to hold the same closed beneath the material being placed therein and to progressively permit the opening of the container as it is being filled. Special means, including adapter frames, are provided for clamping the mouth of a container in sealed relation to the filler. Also, in order to provide accurate weights within each filled container, weighing mechanisms may be provided in advance of the filler, the

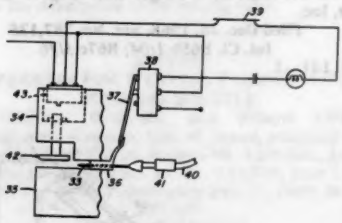


weighing mechanism operating alternately whereby while a new charge is being weighed, a previously weighed charge is being directed into a container by the filling mechanism.

3,589,412
APPARATUS FOR INJECTING FLUID INTO A DISTENSIBLE BAG

Gerald Isaak Pasternak Levenson, and Andrew Green, both of Harrow, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 705,329, Feb. 14, 1968, filed Dec. 29, 1969, Ser. No. 001,921
Int. Cl. B65b *1/30*
U.S. Cl. 141—95 **4 Claims**



An apparatus for processing film that injects fluid into a self-sealing package containing a photosensitive film, measures the distension of the package, terminates the flow of fluid into the package when the package has reached a predetermined size and agitates the package to cause the injected fluid to flow uniformly upon the film emulsion.

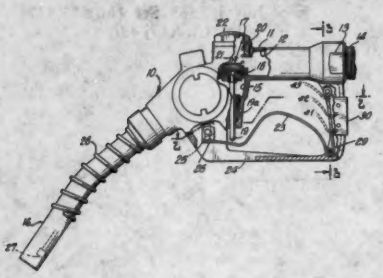
3,589,413
AUTOMATIC LIQUID DISPENSING NOZZLE

Eugene W. Vest, Wappingers Falls, N.Y.; Dean C McGahey, Fishkill, N.Y., and Richard H. Griswold, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 671,742, Sept. 29, 1967, Pat. No. 3,520,338.
Filed June 19, 1969, Ser. No. 871,069
Int. Cl. B65b *3/24;* **B67d** *5/28, 5/372*
U.S. Cl. 141—128 **1 Claim**

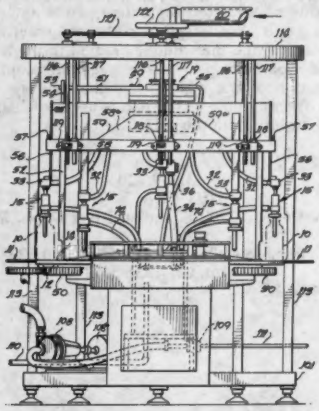
An automatic liquid dispensing nozzle wherein a lever, used to activate a control valve and regulate the rate of flow therethrough, is engaged by a holding means against the control valve, being released therefrom by automatic means

upon the liquid being dispensed reaching a predetermined level, and subsequently being engaged by manual operation



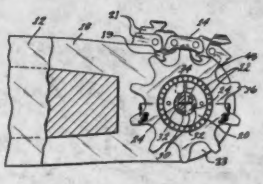
against a restraining member which permits the filling operation to be completed at a predetermined low rate of flow.

3,589,414
ROTARY GRAVITY HIGH-SPEED FILLER
James A. Risser, Northbrook, Ill., assignor to U.S. Bottlers Machinery Company, Chicago, Ill.
Filed Mar. 4, 1968, Ser. No. 710,051
Int. Cl. B65h *43/60*
U.S. Cl. 141—147 **7 Claims**



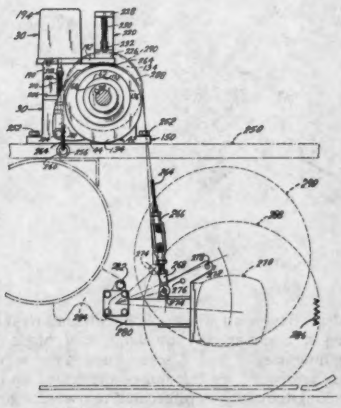
A rotary gravity high-speed filling apparatus for the automatic filling of plural containers of glass or plastic delivered to the apparatus, each with a predetermined quantity of a product or liquid to be dispensed. The filling mechanism successively raises and lowers the individual filling stems into the spaced containers, and is provided with a main distributing valve and adjustable cam means for controlling the flow of the liquid supplied by gravity to the filling stems with any overflow directed to an overflow system including an overflow tank having a diffuser plate whereby any product overflow is directed to the sides of the tank and maintained quiescent. Each filling stem is lowered into its aligned container and provided with concentric tubular members including a free-floating outer tubular member and a spaced inner tubular member whereby upon lowering the stem to dispensing position into a container by the adjustable cam, the inner tubular member exposes its filling opening for dispensing a predetermined quantity of liquid to its container. All product flow to the filling stems and overflow therefrom is directed downhill and the individual filling stems require no internal packing or seals and the concentric tubular members provide a plastic-to-metal sliding fit.

3,589,415
CHAIN SAW BAR
Norman C. Locati, Lake Oswego, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.
Filed Nov. 12, 1969, Ser. No. 875,700
Int. Cl. B27b *17/04*
U.S. Cl. 143—32 **5 Claims**



A chain saw bar having a sprocket rotatably mounted in the nose of the saw bar guiding a saw chain around the outer end of the saw bar. The sprocket is rotated on roller bearings that are supported by an inner race member that is fastened between two sideplates that form the nose of the saw bar. The means for fastening the inner race to the sideplates includes a removable lock mechanism having a pair of stud members. A stud member is inserted through each side plate to independently lock the inner race to each sideplate. With the aid of a simple tool a worn or broken sprocket can be easily removed from the saw bar and replaced with a new sprocket.

3,589,416
ORBI-LIFT POSITIONING DEVICE
Warren H. Zuercher, and Pierre Juillerat, both of Seattle, Wash., assignors to Stetson-Ross Machine Company, Inc., Seattle, Wash.
Filed May 31, 1966, Ser. No. 553,747
Int. Cl. B27b *5/00*; F16d *3/44*
U.S. Cl. 143—46 **7 Claims**



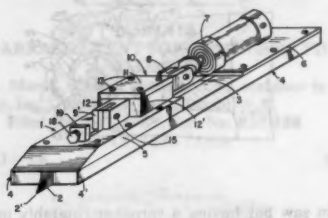
This invention is for a positioning device to position apparatus in different positions, such as a saw assembly in different positions. In a saw mill trimmer there are a number of saws. In the trimming of lumber it is to have some or all of the saws out of contact with the lumber. At other times it is necessary to have some or all of the saws in contact with the lumber. This invention is directed to the positioning of the saws in contact with the lumber and out of contact with the lumber.

3,589,417

RETRACTABLE SPUR KNIFE DEVICE FOR VENEER LATHE

Royal C. Cady, Highbridge, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 9, 1969, Ser. No. 831,426
Int. Cl. B27l *5/04*
U.S. Cl. 144—215 4 Claims



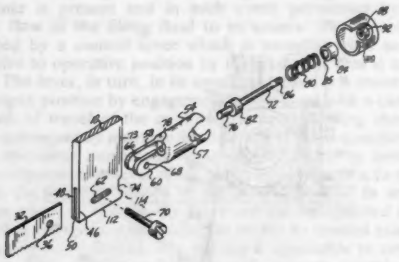
A retractable blade spur knife device for use with a veneer lathe which uses a fluid power cylinder to provide for the extension and retraction of the spur knife blade from the device. A toothed portion of the spur knife blade which is adapted to engage with teeth in a movable plunger member from the power cylinder provides adjustment means in the device to take care of wear resulting from repeated sharpenings of the cutting end of the knife blade.

3,589,418

HANDSAW WITH BLADE TENSION SETTER AND ABSORBER

Arthur E. Clark, 745 La Prairie, Ferndale, Mich.

Filed May 15, 1969, Ser. No. 824,766
Int. Cl. B27b *21/02*
U.S. Cl. 145—33 10 Claims



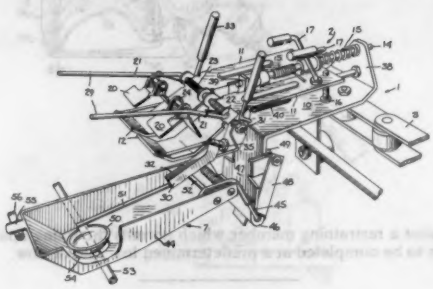
A handsaw having an adjustable handle and rigid frame for supporting a commercially available saw blade having a mounting hole in each end. A screw passing through one hole threads to a forward leg portion of the frame and supports the blade longitudinally. A bifurcated rearward leg portion of the frame has transversely aligned, elongated apertures extending therethrough and embraces the other end of the blade. An apertured clevislike member embraces the rearward leg portion and a pin through the apertures totally supports the clevislike member on the rearward leg portion and extends through the hole in the other end of the blade. A spring biased plunger radially disposed from the pivot pin is carried by the clevislike member and engages a notch in the rearward leg portion of the frame to substantially axially align with the saw blade, to thereby lock and resiliently set the tension of the saw blade.

3,589,419

EGG-CRACKING HEAD AND SEPARATING MEANS

Alvin T. Classen, Norfolk, Nebr., assignor to Henningsen Foods, Inc., White Plains, N.Y.

Filed July 3, 1969, Ser. No. 838,837
Int. Cl. A47j *43/14*
U.S. Cl. 146—2 6 Claims



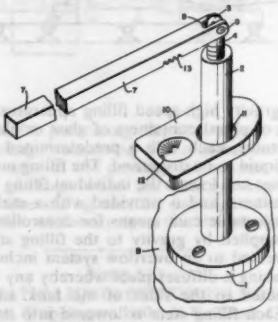
An improved separating means for use on automatic egg-breaking machines of the type which receive whole eggs and fed them to cracking heads and separating means. The cracking heads crack or open the eggs and drain the egg yolks and the egg whites into separating pans for draining the yolks and the whites into separate storage containers. The improved separating means of this invention includes an egg-cracking unit having egg-gripping jaws and attached egg-cracking knives. A related separating pan is mounted below the cracking unit. A yolk spoon in the pan receives the yolk and contains it while the white is drained through a draining hole in the separating pan into an egg-white container. The draining action of the white while the yolk spoon is held above the draining hole in the pan is used to cleanly tear or separate the white from the yolk.

3,589,420

NUT CRACKER

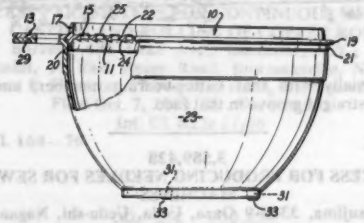
William E. Davis, 10309 S. Indian River Drive, Fort Pierce, Fla.

Filed Mar. 26, 1969, Ser. No. 810,523
Int. Cl. A23n *5/02*
U.S. Cl. 146—16 2 Claims



Apparatus for cracking nuts, consisting of a vertical post rigidly attached to a base or plate, a cracking lever swiveled and pivoted to the upper end of the post and preferably vertically adjustable relatively thereto, and an anvil to receive and hold a nut to be cracked. The anvil is instantaneously vertically adjustable on and along the post, to accommodate nuts of different sizes and diameters.

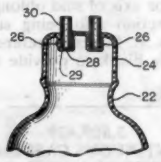
3,589,421
REVERSIBLE GRATER
Maurice Locker, 86 Cavendish Road, Salford, 8 Lancashire, England
Filed Mar. 12, 1969, Ser. No. 806,440
Claims priority, application Great Britain, Jan. 7, 1969, 869/69
Int. Cl. B02c *19/20*
U.S. Cl. 146—180 5 Claims



A one-piece, plastic grater for foodstuffs has cutting edges provided at each of two opposed generally flat, horizontal surfaces thereof, the said cutting edges being located around the peripheries of circular through holes in a grater body. According to the nature of the cutting action required, that is to say shredding or grating, so the cutting edges comprise a single curvilinear, toothlike edge at each through hole on one surface or a plurality of angular toothlike edges distributed about the periphery of each such hole on the opposite surface.

An upper or lower peripheral flange seats the grater within the rim of a bowl and both grater and bowl have mating handles for clamping the parts together.

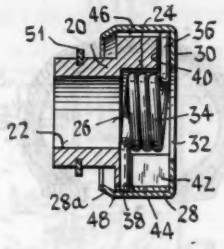
3,589,422
SEALED BAG FOR LIQUIDS
David Bellamy, Jr., Kenilworth, and Philip Gregory Ralston, Villa Park, both of, assignors to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Mar. 17, 1969, Ser. No. 807,759
Int. Cl. B65d *1/00, 17/06*
U.S. Cl. 150—1 6 Claims



A sealed bag for containing liquids. Typically made by a blow-molding process from a tube of molten thermoplastic resin. The bag comprises a tubular body of flexible plastic, sealed at one end, and narrowing to an integral tubular neck portion at the other end. A head portion, integral with the neck portion, seals the bag. A tubular recess is formed, typically in the head portion of the bag, for receiving a needle or the like for puncturing the bag to obtain the liquid contents. Generally, the cross section of the bag is oval, and a hanger at one end of the bag is attached thereto at a single station to facilitate collapse of the bag as liquid is withdrawn.

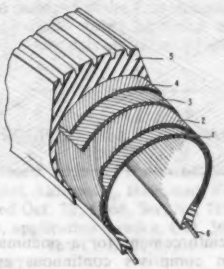
3,589,423
LOCKING-TYPE MACHINE NUT
Joseph R. Metz, Ridgefield, Conn., assignor to Norco, Inc., Ridgefield, Conn.
Filed June 10, 1969, Ser. No. 831,918
Int. Cl. F16b *37/12*
U.S. Cl. 151—14 6 Claims

A nut comprising an unthreaded annular body in which a screw part is received, said body having a shoulder disposed in and intermediate the ends of the bore of the body. A helical coil spring is located in the bore, with one end portion abutting the shoulder. The spring has radial terminals passing through openings in the annular body, one terminal being capable of appreciable freedom of movement. A shell surrounds, and is turnably movable on the annular body, said



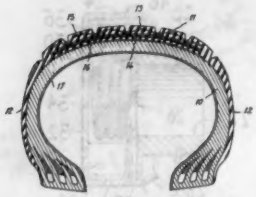
shell having lost-motion connections with the spring terminals. The nut is screwed onto its cooperable screw part, which threads into the coil spring, slightly expanding the same to effect a friction grip. The outer shell can apply forces to either end of the coil spring, to accomplish the screwing-on or unscrewing of the nut.

3,589,424
PNEUMATIC TIRE
Shiro Sasaki, Toyonaka-shi; Narajiro Shibata, Suita-shi, and Yoshiaki Takami, Suita-shi, all of, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Nishi-Ku, Osaka, Japan
Filed Apr. 4, 1968, Ser. No. 718,912
Claims priority, application Japan, Apr. 22, 1967, 42/25969
Int. Cl. B60c *9/10*
U.S. Cl. 152—354 9 Claims



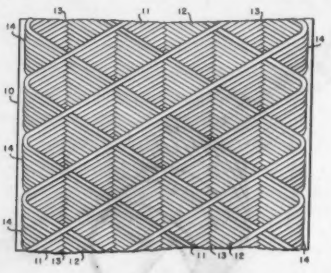
A pneumatic tire having a tread rubber compound of a vulcanizable rubber composition comprising 100 parts by weight of a rubber containing at least 20 percent by weight of a stereo-regular polybutadiene or stereo-regular SBR incorporated with from 40 to 100 parts by weight of a high structure carbon black of particle sizes not exceeding 30 millimicrons; a polyester casing ply cord whose angle is within the range of 30° to 45°; and a breaker cord consisting of a material having a higher modulus and a lower growth than said polyester casing, the angle of said breaker cord being within the range of 25° to 40° but always at least 2° smaller than the angle of said casing ply cord.

3,589,425
HEAVY DUTY TIRES
Jean Francis Olagnier, Ermont, France, assignor to Penumatiques Caoutchouc Manufacture Et Plastiques Kleber-Colombes, Colombes, France
Filed Feb. 28, 1969, Ser. No. 803,251
Claims priority, application France, Mar. 1, 1968, 142160
Int. Cl. B60c 9/16
U.S. Cl. 152—361 3 Claims



This invention relates to heavy duty tires, for example, for airplanes. According to the invention, there are located within the tread two superimposed reinforcing layers of metal cables that are oriented obliquely, with one layer crossing the other. The assembly of these two layers forms a protective means located immediately below the area of the tread pattern and being separated from the tire casing by a layer of rubbery material of substantially constant thickness that is free from filamentary reinforcement.

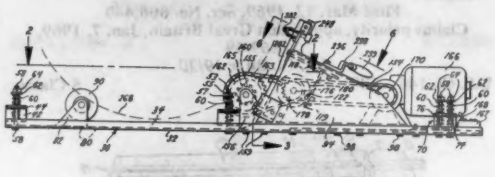
3,589,426
METHOD FOR PRODUCING ENDLESS REINFORCEMENTS FOR PNEUMATIC TIRES
George C. Varner, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed Apr. 2, 1969, Ser. No. 812,766
Int. Cl. B60c 9/20
U.S. Cl. 152—361 22 Claims



The endless reinforcement for a pneumatic tire of the present invention comprises continuous cord forming a generally zigzag pattern and being positioned across the width of the reinforcement from one side to the other at an angle to the edges of the reinforcement with reversals at the edges. Lengths of the cord between the reversals are interleaved with lengths disposed in an opposite direction along at least one line substantially parallel and intermediate the edges thereof. Also, a method for producing a tire including such reinforcement and the resulting tire.

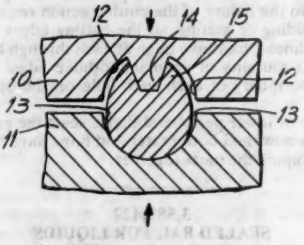
3,589,427
TIRE-GROOVING MACHINE
Millard G. Love, Pacific, Mo. 63069
Filed Nov. 28, 1969, Ser. No. 880,691
Int. Cl. B29h 21/08
U.S. Cl. 157—13 10 Claims

A cutter-bearing member is disposable adjacent the face of a tire and is movable axially of that tire to form a zigzag groove in that face; and a cutter-bearing element is moved toward that face by that cutter-bearing member but does not



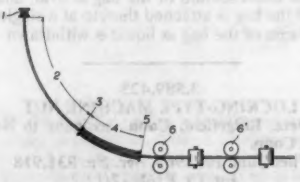
move axially with that cutter-bearing member, and thus forms a straight groove in that face.

3,589,428
PROCESS FOR PRODUCING NEEDLES FOR SEWING MACHINES
Sho Masujima, 3366-9 Oaza, Ueda, Ueda-shi, Nagano-Ken, Japan
Filed Nov. 5, 1969, Ser. No. 874,189
Int. Cl. B21g 1/04
U.S. Cl. 163—5 8 Claims



A process for producing needles for sewing machines by forming a needle blank having a portion of reduced diameter, side rolling the needle blank into an oblong cross section, and press forming said needle blank between a pair of die blocks equipped with a groove-forming projection, said die blocks being brought together along a path substantially aligned with the major axis of said oblong cross section, the groove-forming projection also being substantially aligned with said major axis. A flattened reference plane may be formed in said needle blank to provide a reference for the remaining processes.

3,589,429
METHOD FOR CONTINUOUS CASTING, COOLING AND SHAPING OF METAL BARS
Rudolf Schoffmann, Linz, Austria, assignor to Vereinigte Osterreichische Eisenund Stahlwerke Aktiengesellschaft, Linz, Austria
Filed Dec. 10, 1968, Ser. No. 782,630
Claims priority, application Austria, May 29, 1968, A5131/68
Int. Cl. B22d 11/12
U.S. Cl. 164—76 2 Claims



Cooling a continuously cast bar in a cooling zone arranged after the mold, in which cooling zone the surface tempera-

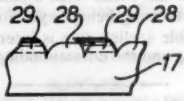
ture of the bar is kept substantially equal, terminating the cooling procedure prior to complete solidification of the bar, and leading the bar which still retains a liquid core into an equalization zone, where due to heat emission from the liquid core the surface temperature of the bar is brought to rise to a temperature which is higher than that prevailing in the marginal zone upon entrance of the bar into the equalization zone.

3,589,430

PROCESS PARAMETERS FOR CONTINUOUS MELTING-CASTING AND ROLLING OF COPPER ROD

Henry Barrow, 496 Lake Ave., Lancaster, N.Y.; Jack E. Schmidt, 11 East Home Road, Bowmansville, N.Y., and Robert E. Fromson, 27 Dogwood Road, Williamsville, N.Y.

Filed Oct. 7, 1969, Ser. No. 864,561
Int. Cl. B22c *11/06*
U.S. Cl. 164—76 **5 Claims**



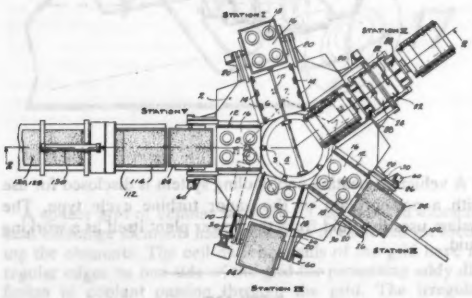
A method is described for the continuous production of copper rod in which copper is continuously melted, continuously cast, conditioned and hot-worked into rod form without any intermediate reheating. The essential steps include control of the melt temperature, oxygen content, solidification point, cast billit temperature and hot-rolling temperature.

3,589,431

MOLD MAKING EQUIPMENT UTILIZING VERTICAL MOLD BLOWING AND PLURAL RAMMERS

Harrison E. Fellows, Clearwater Lake, Wis.

Filed Jan. 9, 1969, Ser. No. 790,072
Int. Cl. B22c *15/28*
U.S. Cl. 164—172 **11 Claims**



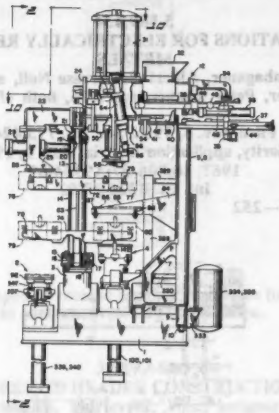
Bottomless cope and drag boxes mounted on a turntable are cleaned, assembled upon a pattern plate, turned on edge and clamped between closure platens and filled with molding sand. The platens are then advanced into the boxes to compress the sand against the patterns to form molds. Upon withdrawal of the platens, a sprue hole is made, the assembly is rotated to horizontal, and the boxes and contained molds are separated from the pattern plate, which is then withdrawn. After insertion of cores, if any, the boxes and molds are reclosed. An elevator rises through a withdrawal yoke into engagement with the mold whereupon a complementary platen opposing the elevator forces the sand mold downwardly from the boxes and into the plane of the yoke to the level of a withdrawal table onto which the yoke draws the mold, leaving the boxes empty for repetition of the process.

3,589,432

MATCH PLATE FOUNDRY MOLDING MACHINE

Leon F. Miller, Rocky River; Henry J. Herbruggen, Westlake, and Robert G. Shields, Chagrin Falls, all of, Ohio, assignors to The Sherwin-Williams Company

Filed Oct. 2, 1967, Ser. No. 672,063
Int. Cl. B22c *17/10*
U.S. Cl. 164—182 **29 Claims**



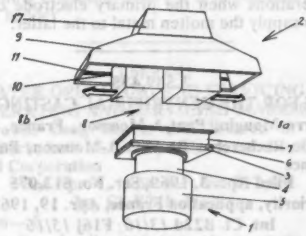
A foundry molding machine utilizing a match plate and two sets of rubber-lined cope and drag slip flasks with two stations; one station assembling one set of flasks with the match plate therebetween and then rolling over the flask-match-plate assembly to fill the drag with sand while supporting the assembly on the cope and jolting and applying a low-pressure preliminary squeeze to the sand within the drag, rolling the assembly back to fill the cope and then supporting the assembly on the sand within the drag for the application of jolt and high-pressure squeeze to the sand in both the cope and drag, separating the assembly and indexing the cope and drag vertically separated to a second station while simultaneously indexing the second set of flasks to the first station, holding the sand-rammed flasks vertically separated in the other station to permit coring and closing the flasks and stripping the sand cakes thus assembled therefrom to be placed on a bottom board while the second set of flasks are being filled and rammed at the first station; the indexing and rollover of such flasks being obtained each by a piston-cylinder assembly having controlled stroke deceleration on extension thereof.

3,589,433

TWO-PIECE SQUEEZE PLATE IN A SAND MOULDING MACHINE

Olof Johan Gerhard Hedberg, Halmstad, Sweden, assignor to Malcus Industri, Aktiebolag, Halmstad, Sweden

Filed Oct. 22, 1968, Ser. No. 769,594
Claims priority, application Sweden, Oct. 30, 1967, 14853/67
Int. Cl. B22c *15/02*
U.S. Cl. 164—207 **7 Claims**



A molding machine in which a pressure plate and a support plate for a mold box are movable toward each other for

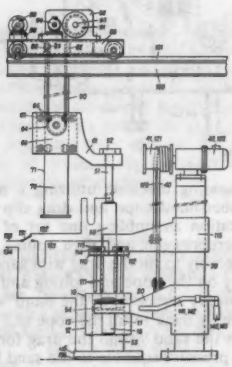
compacting molding sand in a mold box placed upon the support plate comprises a pressure plate composed of two complementary parts. These plate parts can be selectively moved either into an engaged position in which they form a continuous pressure plate or into a spaced-apart position. In the latter position the two plate parts open a discharge for feeding molding sand into the box through a feed duct in a housing part of the machine.

3,589,434

INSTALLATIONS FOR ELECTRICALLY REMELTING METALS

Otmar Kleinhagauer, Albert Bohlerasse Noll, and Wolfgang Holzgruber, Peter Tannerstrasse 16, both of Kapfenberg, Austria

Filed Nov. 5, 1968, Ser. No. 773,424
Claims priority, application Austria, Nov. 9, 1967, Nov. 6, 1967, 10,006/67;A9954/67
Int. Cl. B22d *27/02*
U.S. Cl. 164—252 **10 Claims**



An installation for electrically remelting a metal so that molten metal achieved in this way from a suitable electrode can be given a predetermined configuration in a mold. The molten metal in the mold is maintained at its elevated temperature during changing of a primary electrode by way of a secondary electrode, and a pair of carriage means are provided for respectively supporting these electrodes. One transporting means is operatively connected with the carriage means which supports the primary electrode to displace the latter away from the mold when it becomes necessary to exchange an at least partially consumed primary electrode with a new primary electrode. The secondary electrode supporting carriage and the mold form a pair of units one of which is acted upon by a second transporting means for displacing these units with respect to each other in such a way that when the primary electrode is displaced away from the mold the secondary electrode and mold coact with each other to maintain the molten metal at its elevated temperature, while the secondary electrode is maintained normally at an inoperative position displaced from the mold during the normal operations when the primary electrode coacts with the mold to supply the molten metal to the latter.

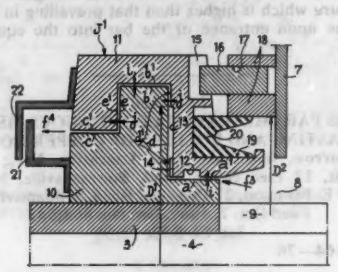
3,589,435

MACHINE FOR THE CENTRIFUGAL CASTING OF PIPES

Andre Pierre Mougin, Pont-A-Mousson, France, assignor to Centre De Recherches De Pont-A-Mousson, Pont-A-Mousson, France

Filed Apr. 3, 1969, Ser. No. 813,075
Claims priority, application France, Apr. 19, 1968, 148643
Int. Cl. B22d *13/10;* **F16j** *15/16*
U.S. Cl. 164—297 **5 Claims**

Machine for centrifugally casting pipes having a casting shell and a cooling water jacket coaxial and rotating with the shell. Water is supplied to and discharged from the jacket by way of annular fixed parts coaxial with the jacket. A seal is interposed between each fixed part and the jacket. Each seal comprises a collar connected to rotate with the jacket, a ring



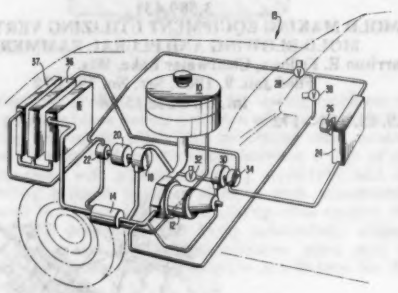
freely mounted on the collar with a small radial clearance therebetween and the ring being keyed to the corresponding fixed part. A flexible sealing ring is interposed between the freely mounted ring and the corresponding fixed part.

3,589,436

VEHICULAR AIR-CONDITIONING AND HEATING SYSTEM

James H. Anderson, 1615 Willock Lane, York, Pa.

Filed May 15, 1969, Ser. No. 824,909
Int. Cl. B60h *3/04*
U.S. Cl. 165—23 **9 Claims**



A vehicular heating and cooling system is disclosed for use with a power plant of the vapor turbine cycle type. The system uses the fluid from the power plant itself as a working fluid.

3,589,437

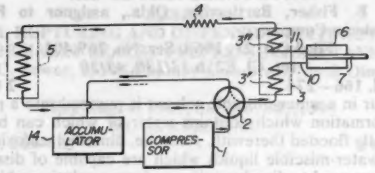
HEAT PUMP SYSTEM AIR CONDITIONERS

Kunihiro Shoji, Sakai-shi, and Satoru Sato, Kawachinagano-shi, both of, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 22, 1969, Ser. No. 887,096
Claims priority, application Japan, Dec. 28, 1968, Dec. 24, 1968, 43/113205;44/1807
Int. Cl. F25b *29/00*
U.S. Cl. 165—29 **10 Claims**

A heat pump-type air conditioner which is so designed that a lack of heating capacity in the heating operation when the outdoor temperature is low in winter is supplemented by refrigerant heating means consisting of an electric heater provided at an intermediate position of the refrigerant passage line of an indoor heat exchanger for heating the refrigerant to provide for recondensation of the refrigerant

which has once been condensed; in the heating operation the refrigerant in the refrigeration cycle is decreased from the quantity used in the cooling operation and maintained in a



quantity optimum for the heating operation; and further defrosting of an outdoor heat exchanger can quickly be attained; and which can be operated efficiently with no fear of fire.

3,589,438

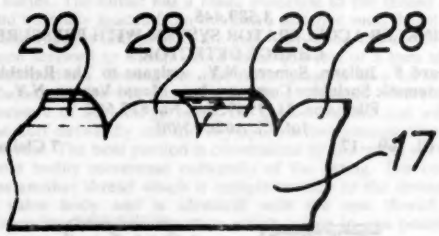
SPACER GRID FOR HEAT EXCHANGE ELEMENTS WITH EDDY DIFFUSION PROMOTION MEANS

Colin Boorman, Altringham, and Colin Betts, Hale, both of, England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of application Ser. No. 594,168, Nov. 14, 1966, now Patent No. 3,439,737, dated Apr., 1969. This application Apr. 18, 1969, Ser. No. 817,329

Int. Cl. F28f *13/12, 9/24;* G21c *3/34*

U.S. Cl. 165—109 1 Claim



A spacer grid of cellular form for an assembly of elongate heat exchange elements has projections in each cell for locating the elements. The cell defining walls of the grid have irregular edges on one side of the grid for promoting eddy diffusion in coolant passing through the grid. The irregular edges may be formed by sections defined by slits or incisions in the edges and deformed out of the planes of the cell-defining grid walls.

3,589,439

VEHICLE RADIATOR CORE ASSEMBLY

Homer D. Huggins; Thomas C. Bartlett, and Donald J. Frost, all of Racine, Wis., assignors to Modine Manufacturing Company

Filed Oct. 5, 1966, Ser. No. 584,491

Int. Cl. F16s *3/08;* F28f *19/00*

U.S. Cl. 165—134 1 Claim

A vehicle radiator core assembly that includes a plurality of coolant tubes and a core protector mounted at the front of the core on the upstream side of the coolant air stream to intercept damaging flying foreign objects carried by the air stream, the protector including an open network of intersecting rigid strips arranged on edge relative to the core with

each strip shaped to receive another strip so as to be self-supporting prior to permanent joining of the strips.

3,589,440

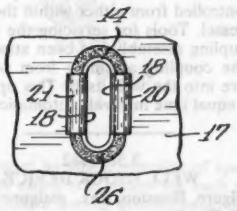
TUBE AND HEADER CONSTRUCTION

Oscar G. Friedrich, Sturtevant, Wis., assignor to Modine Manufacturing Company

Filed Dec. 1, 1969, Ser. No. 881,052

Int. Cl. F28f *9/04*

U.S. Cl. 165—178 7 Claims



A tube and header construction which may be used in a cooling radiator for an internal combustion engine in which one end of each tube extends into the header through an opening in a wall member forming a liquid-confining part of the header and with spaced end portions of the tube end within the header being separate from the remainder of the tube and distorted to extend away from this remainder thereby to secure the tube end to the header wall member. In one embodiment of the invention these spaced end portions of the tube within the header are curved over until their extreme ends are in contact with the inner surfaces of the wall member. In another embodiment the tube end portions are used to secure a solid joining material such as a brazing material in position to be activated as by melting in a subsequent joining operation where it is in position to bond the tube to the header.

3,589,441

DEEP WATER OPERATING AND SERVICING SYSTEM FOR OPERATING AND SERVICING MARINE WELLS

Walter Brown, Long Beach, and Warren S. Messenger, Canoga Park, both of, Calif., assignors to North American Rockwell Corporation

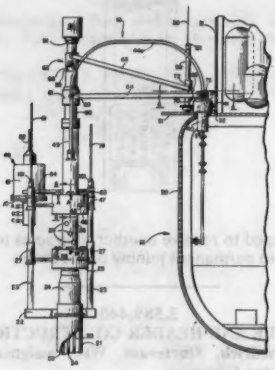
Filed Apr. 1, 1968, Ser. No. 717,761

Int. Cl. E21b *33/035*

U.S. Cl. 166—.6 16 Claims

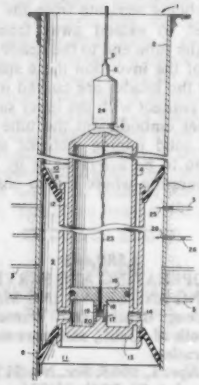
The invention is directed towards an underwater well operating and servicing module and a coupling assembly which can be connected to a number of underwater wells and which is also capable of sustaining human life within for

repair and inspection. The module is shaped as an upright cylindrical shell which reduces abruptly to a smaller diameter providing a substantially horizontal ledge surface when the module is in position on the ocean bottom. A number of wells are positioned around the module at approximately equal radial distances. A flexible coupling assembly having both ends thereof directed downwards is secured by means of detachable connectors between the well and the module. Each of the connectors are guided to their respective receptacles at the well and module by means of guidelines and



guidepins projecting upwards from the well and module to a surface vessel. The weight of the coupling assembly forces the connectors into position at their respective receptacles and they are then locked into position by hydraulic or electric means controlled from either within the module or from the surface vessel. Tools for servicing the particular well to which the coupling assembly has been attached are then inserted into the coupling assembly from within the module and from there into the well itself. This operation is usually performed at equal time intervals automatically.

3,589,442
WELL SHOCK DEVICE
Marion D. Kilgore, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed June 27, 1969, Ser. No. 837,069
Int. Cl. E21b *43/25*
U.S. Cl. 166—63 **1 Claim**



A shock device for unplugging perforations in a well and the like which comprises a chamber of low pressure relative to the pressure adjacent the perforations, the chamber being suddenly openable to the pressure adjacent the perforations with a consequent shock effect on the perforations.

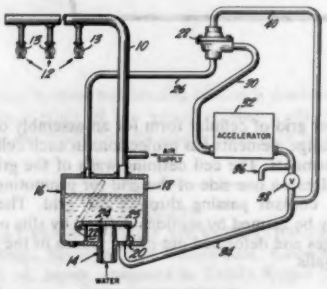
3,589,443
SEALING OF PERMEABLE FORMATIONS IN WATER FLOOD RECOVERY OF OIL
Henry B. Fisher, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Oct. 21, 1968, Ser. No. 769,401
Int. Cl. E21b *33/138*, *43/20*
U.S. Cl. 166—274 **2 Claims**

Sulfur in a water-miscible solvent is pumped into a permeable formation which contains water or which can be subsequently flooded therewith. Acetone, dimethyl sulfoxide and other water-miscible liquids which are capable of dissolving sulfur are used to dissolve sulfur to form a solution which will remain stable for several days under tests. This solution is pumped into the permeable formation, whereupon with contact of water therein the sulfur precipitates to cause sealing or plugging of the formation. The method is applied in a method for producing oil by waterflooding.

3,589,444
AQUEOUS FLUID DRIVE SYSTEM FOR OIL RECOVERY PROCESSES
Alvin C. Johnson, Mount Carmel, Ill., and Clyde G. Inks, Taylor, Mich., assignors to Wyandotte Chemicals Corporation, Wyandotte, Mich.
Filed Nov. 10, 1969, Ser. No. 875,588
Int. Cl. E21b *43/22*
U.S. Cl. 166—274 **7 Claims**

A method for recovering residual oil from a subterranean oil bearing formation by an aqueous fluid drive system includes the steps of (a) introducing into the formation an aqueous slug of a solid high molecular weight polyethylene oxide polymer dispersed in a liquid nonionic surfactant, and (b) thereafter, introducing into the formation an aqueous drive solution containing a minor amount of the polymer dispersed in surfactant composition.

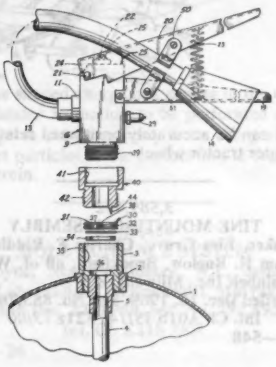
3,589,445
SPRINKLER ACCELERATOR SYSTEM WITH PRESSURE CHANGE DETECTOR
Richard F. Juliano, Somers, N.Y., assignor to The Reliable Automatic Sprinkler Company, Inc., Mount Vernon, N.Y.
Filed Apr. 21, 1969, Ser. No. 817,695
Int. Cl. A62c *35/00*
U.S. Cl. 169—17 **7 Claims**



In the particular embodiment of the invention disclosed herein, a dry pipe sprinkler system comprises a sprinkler pipe communicating with a plurality of sprinkler heads and normally containing air under pressure. A water pipe normally containing water under pressure is connected to the sprinkler pipe by a dry pipe valve which normally prevents the passage of water. When a sprinkler head is actuated, the dry pipe valve opens and allows the water to flow thereto. For more rapidly opening the dry pipe valve, an accelerator valve responsive to a pressure drop in the sprinkler pipe, directs air to the dry pipe valve so as to increase the pressure on one

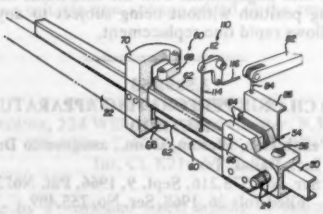
side thereof. A pressure-responsive control valve is associated with the accelerator valve and normally allows the passage of air to the accelerator valve; however, when the dry pipe valve opens, the control valve closes, thus preventing the passage of water to the accelerator valve.

3,589,446
SEAL RUPTURING AND DISPENSING FIXTURE FOR NORMALLY SEALED PREPRESSURIZED TANKS
James C. Bower, 25505 Country Club Blvd., North Olmstead, Ohio
Filed Aug. 4, 1969, Ser. No. 847,159
Int. Cl. A62c *13/00*
U.S. Cl. 169—31 **8 Claims**



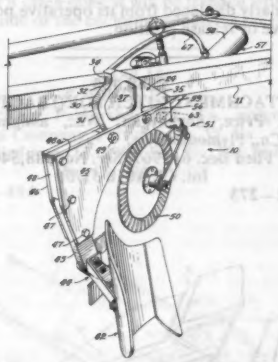
A pressurized tank charged with fire-extinguishing material is closed by a fitting having a discharge passage closed by a seal. The fitting is threaded for connection with one thread of a cutter. The cutter has a blade eccentric to the thread axis and normally spaced from the seal a distance such that it initially engages and pierces the seal only when the cutter has been screwed to within about three-quarters of a turn of its final position. During the last three-quarters of a turn, the blade cuts a kerf of about 270° through the seal, whereupon pressure of the charge bends the portion of the seal within the kerf outwardly and thereby opens a free passage through the seal. The bent portion is constrained by the uncut portion from bodily movement outwardly of the fitting. The cutter has another thread which is complementary to the thread of a valve body and is identical with the one thread. A dispensing hose has a portion which, when in one position, prevents opening of the valve.

3,589,447
CONTROL SYSTEM FOR DOZER
David H. Seaberg, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.
Filed Dec. 6, 1968, Ser. No. 781,725
Int. Cl. A01b *63/112*
U.S. Cl. 172—9 **9 Claims**



A position- and load-sensing mechanism which is capable of automatically maintaining a tool pivotally supported on a vehicle in either a predetermined position with respect to the vehicle and/or a predetermined load on the tool. The load-sensing mechanism incorporates mounting means for pivotally supporting the pivot axis for the tool along an axis perpendicular thereto with spring means acting on the mounting means in a manner that changes in pivotal position of the mounting means indicate changes in load on the tool. The mechanism further includes an element for sensing changes from a predetermined position of the tool with respect to the vehicle and means for integrating the two signals to produce a single output signal that controls the position of a control valve which in turn selectively supplies fluid to or from fluid motor means which are adapted to raise or lower the tool on the vehicle.

3,589,448
TRIP MECHANISM FOR GROUND-WORKING IMPLEMENT
James E. Gay, Vinton, Iowa, assignor to J. I. Case Company
Filed Sept. 27, 1968, Ser. No. 763,072
Int. Cl. A01b *61/04, 35/24*
U.S. Cl. 172—264 **15 Claims**

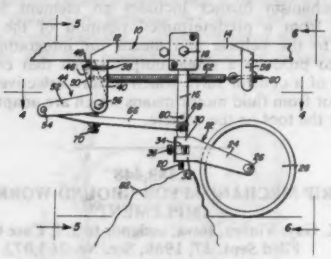


A tillage implement having a plurality of spaced ground-working tools, with safety trip means for each tool allowing the tool to move from a normal ground-penetrating position to a position elevated thereabove when an obstruction, such as a rock or a stump, is encountered. Each ground-working tool is mounted for free-swinging movement between the ground-penetrating position and a fully elevated position above the ground, and the tool is positively guided to and from the ground-working position, with the guiding means functioning to allow the ground-working tool to initially move out of the ground-penetrating position without substantial downward movement into the ground, and with the guiding means also functioning to direct the ground-working tool back into the ground at the proper angle of reentry. Hydraulic cylinder means continuously biases each tool toward the ground-penetrating position, with the hydraulic cylinder means yieldably resisting movement of the tool away from the ground-penetrating position and returning the ground-working tool into the ground-penetrating position after the obstruction has been cleared.

3,589,449
PLOW COULTER AND RELEASE MECHANISM
Selden G. Washburn, Rural Route, Goodwin, S. Dak.
Filed Feb. 4, 1969, Ser. No. 796,535
Int. Cl. A01b *61/04*
U.S. Cl. 172—265 **4 Claims**

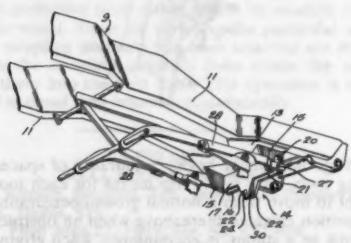
An elevated implement support frame portion having front and rear ends and an upstanding implement support arm depending therefrom and pivotally supported from the frame portion for oscillation about a horizontal axis between a first operative position and a second implement release position with the lower end of the arm swung rearwardly from its operative position. An actuating mechanism including a spring is connected between the support frame and the sup-

port arm through a bellcrank and connecting operating rod for urging the support arm toward its operative position. The actuating mechanism has its component parts relatively arranged whereby maximum biasing action of the spring on the



support arm occurs when the support arm is in its operative position and the biasing action of the spring on the support arm is substantially reduced as soon as the support arm is slightly angularly displaced from its operative position toward its inoperative or release position.

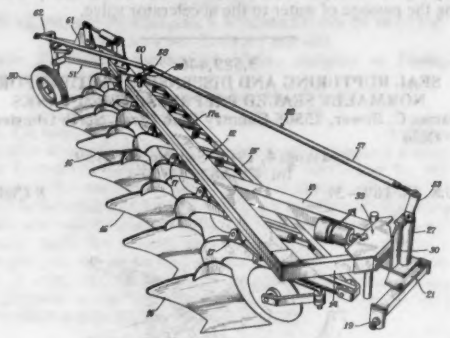
3,589,450
ATTACHMENT HITCH FOR TRACTORS
Warren H. Price, Sheboygan, Wis., assignor to Gilson Brothers Co., Plymouth, Wis.
Filed Dec. 6, 1967, Ser. No. 688,540
Int. Cl. A01b *51/00*
U.S. Cl. 172—273 **5 Claims**



This disclosure relates to an attachment hitch for tractors in which the attachment is connected to and released from the tractor by manipulation of a single pin. The hitch transmits thrust to the attachment draft arms without imposing any stress on the pin. In one embodiment the hitch coupling attached to the implement is free to rock about the axis of the pin, and in another embodiment the hitch coupling is restrained from any such rocking motion. The hitch comprises a hanger bracket attached to the undersurface of the tractor. The bracket has a laterally elongated downwardly open way and a pin socket disposed centrally of the way on a longitudinal axis. The attachment comprises a hitch coupling with a transverse draw bar receivable upwardly into said way and a coupling piece with a pin socket aligned with a pin socket on the hanger bracket and a pin receivable through said sockets to connect the hitch coupling to the hanger bracket.

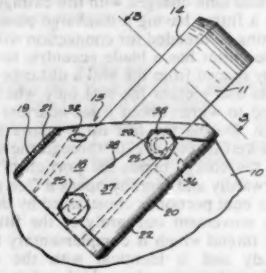
3,589,451
HITCH MECHANISM
Philip D. Wenzel, Rockford, and Gerald L. Gallagher, Love Park, both of, Ill., assignors to J. I. Case Company
Filed Sept. 27, 1968, Ser. No. 763,108
Int. Cl. A01b *69/00, 59/042*
U.S. Cl. 172—285 **6 Claims**

A hitch mechanism for connecting a tillage implement, or the like, to a tractive vehicle, such as a tractor, with the hitch mechanism including means responsive to turning movement of the tractor for steering a tail wheel at the rearward end of the implement. The hitch mechanism is of the "in-furrow" type and includes lateral adjustment means whereby the first



plow bottom can be accurately positioned relative to the inside of the outer tractor wheel.

3,589,452
TINE-MOUNTING ASSEMBLY
Edwin J. Haker, Elm Grove; Charles F. Riddle, Brookfield, and William H. Buelow, Brookfield, all of, Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.
Filed Dec. 10, 1969, Ser. No. 883,761
Int. Cl. A01b *33/14;* **E21z** *13/00*
U.S. Cl. 172—548 **10 Claims**

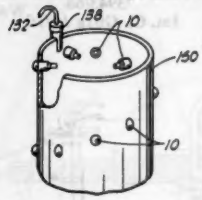


An improved assembly for securing a digging and pulverizing tine to the tine-carrying plate of a rotary earth-working machine includes a U-shaped tine holder secured to a tine plate to form an open-ended socket for receipt of the shank of a tine. Notches in the end and rearward edge of the tine shank are adapted to receive a pair of pins secured within the socket to establish the working position of the tine. The socket provides the primary load-carrying portion of the assembly in operation. A demountable pin inserted into the socket and into engagement with the tine holds the same in the working position without being subject to any working load and allows rapid tine replacement.

3,589,453
SHAPED CHARGE PERFORATING APPARATUS AND METHOD
Alexis A. Venghiattis, Weston, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.
Division of Ser. No. 578,216, Sept. 9, 1966, Pat. No. 3,415,321.
Filed July 26, 1968, Ser. No. 755,489
Int. Cl. E21b *43/117*
U.S. Cl. 175—4.6 **2 Claims**

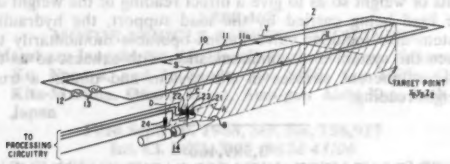
Apparatus for perforating oil and gas wells and the like and methods for completing such wells in an unconsolidated for-

mation. The apparatus includes one or more shaped charges having inert particles located therein arranged to be carried, upon detonation of the charge, into the perforation formed by the charge and also including a carrier for positioning the shaped charge in the well. The method includes the steps of



positioning the shaped charge and carrier in the well adjacent the unconsolidated formation to be perforated and detonating the charge to simultaneously form the perforation and place the inert particles in the perforation to form a permeable bridge therein.

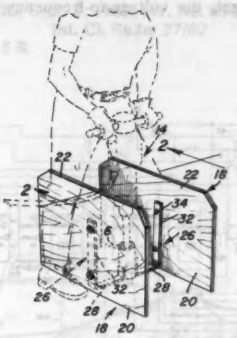
3,589,454
MOLE GUIDANCE SYSTEM
James C. Coyne, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 27, 1968, Ser. No. 792,893
Int. Cl. E21b *7/04*
U.S. Cl. 175—26 **10 Claims**



A subterranean missile is equipped with three mutually orthogonal coils in its body and a fourth suitably fixed in an articulatable steering member. The missile is guided along any desired underground trajectory defined with reference to a coordinate system including the plane of a dipole-quadrupole antenna system laid on the ground above. Voltages induced in the noncenterline body coils are used in a closed feedback loop to maintain the resultant magnetic field circularly polarized at the mole location. Heading errors are then revealed as a voltage phasor on the centerline coil. Rotation of the steering member sufficiently to bring the voltage induced in its coil into phase with the centerline coil voltage also aligns the steering member such that its articulation will reduce the heading error to zero. Any new trajectory may be defined as a suitable new voltage added to the centerline coil voltage.

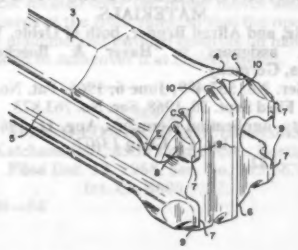
3,589,455
JACK HAMMER SHIELD
Martin Stanton, 224 William St., Port Chester, N.Y.
Filed Nov. 7, 1969, Ser. No. 874,887
Int. Cl. E21c *11/00*
U.S. Cl. 175—209 **7 Claims**

For use by a workman when drilling in concrete with a jack hammer; a drill positioning guide and a shield protectively enclosing the guide. Two spaced parallel panels with a guide sleeve bracketed therebetween provide an accident minimizing shield. This shield and the self-contained guide can be moved from place to place and can be effectually straddled and shiftably maneuvered by the user. Should the



drill break, as it often does, it will be trapped with in the confines of the guide or the enclosing panels, as the case may be.

3,589,456
DRILL BIT
Walter P. McKain, Parkersburg, W. Va., assignor to Acme Fishing Tool Company, Parkersburg, W. Va.
Filed Aug. 25, 1969, Ser. No. 852,564
Int. Cl. E21c *13/08*
U.S. Cl. 175—414 **3 Claims**

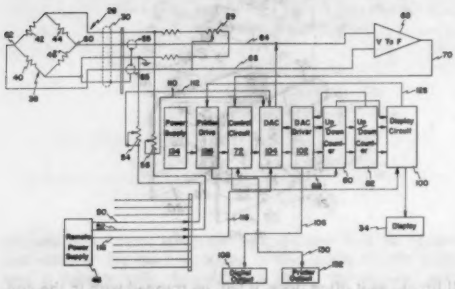


A drill bit having a body and cutting teeth projecting endwise from the body, each of the cutting teeth having a cutting face at its extremity remote from the body, at least certain of the cutting teeth extending laterally to the periphery of the body, the lateral ends of such cutting teeth at the periphery of the body being inclined from the periphery of the body inwardly, normally at an angle between about 120° and about 150°, preferably at an angle of about 135°, to the cutting faces of the teeth. The body of the drill bit may be cut away at each side of each lateral end at the periphery of the body of each cutting tooth which extends laterally to the periphery of the body to cause the cutting tooth to in effect extend into the body at such lateral end thereof with channels in the body on opposite sides thereof.

3,589,457
WEIGHT MEASUREMENT
Dan S. Joos, Murray, Utah, assignor to Intertek Controls, Inc., San Diego, Calif.
Filed July 17, 1969, Ser. No. 842,491
Int. Cl. G01g *3/14*
U.S. Cl. 177—1 **17 Claims**

Weight measurement apparatus and method, the apparatus having normally balanced resistance bridge which becomes unbalanced in an amount which is a function of the weight being measured. A voltage-to-frequency converter senses the imbalance in the bridge and generates a pulse. A digital-to-

analog converter is activated by the pulse to cause an increment of resistance to be added or subtracted into the bridge, each resistance increment being proportional to one unit of weight. If the bridge is not balanced by the addition of the resistance increment, the voltage-to-frequency converter will



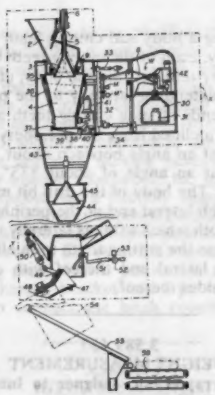
sense the imbalance and serially cause other resistance increments to be added or subtracted until no imbalance in the bridge is sensed. A pulse counter counts each of the pulses which activates the digital-to-analog converter so that the accumulated counts of the counter represent the weight.

3,589,458

APPARATUS FOR FILLING BAGS WITH BULK MATERIALS

Paul Schwake, and Alfred Bruder, both of Oelde, Westphalia, Germany, assignors to Haver & Boecker, Oelde, Westphalia, Germany

Division of Ser. No. 555,499, June 6, 1966, Pat. No. 3,474,836.
Filed Sept. 30, 1968, Ser. No. 763,873
Claim priority, application Germany, Aug. 11, 1965, H 56 825
Int. Cl. G01g *13/02*
U.S. Cl. 177—122 1 Claim



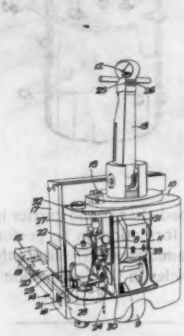
A valve bag filling machine with a double acting dual piston control of a conical valve for coarse and fine flow of bulk material onto an automatic weighing scale and shut-off of the flow of bulk material by dual piston adjustment of the position of the conical valve with relation to its valve seat.

3,589,459

INDUSTRIAL PALLET TRUCK WITH HYDRAULIC WEIGHING MEANS

Arthur Frank Harvey, Basingstoke, Hampshire, England, assignor to Lansing Bagwall Limited, Basingstoke, Hampshire, England

Filed May 20, 1969, Ser. No. 826,225
Claims priority, application Great Britain, May 20, 1968, 23943/68
Int. Cl. G01g *19/10*
U.S. Cl. 177—141 7 Claims



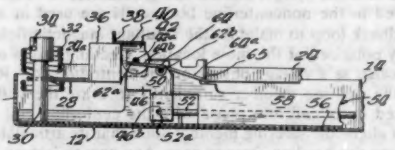
In an industrial pallet or stillage truck of the kind comprising a body portion having a drive unit and being supported on a number of ground wheels, a load support projecting from the body portion of the truck, and an hydraulic system for raising and lowering the load support through a short distance relatively to the body portion so as to pick up a pallet or stillage beneath which the support is introduced, there is provided an hydraulic pressure sensing device calibrated in units of weight so as to give a direct reading of the weight of the load being carried by the load support, the hydraulic system also includes valve means operable momentarily to place the system into communication with exhaust so as to relieve inherent stresses in the system and obtain a true weight reading.

3,589,460

READOUT MECHANISM FOR BATHROOM SCALE

Stan B. Hanssen, Kenilworth, Ill., assignor to Hanson Scale Company

Filed Apr. 18, 1969, Ser. No. 817,473
Int. Cl. G01g *21/08*
U.S. Cl. 177—256 7 Claims



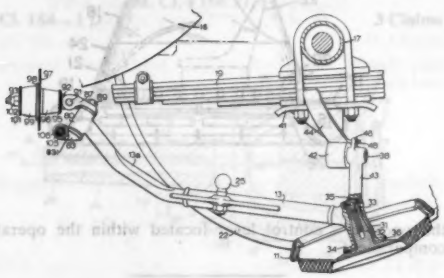
An improvement in the readout mechanism for a platform-type bathroom scale characterized by the provision of a readout mechanism frame which supports the scale disc, crank element and zero adjust mechanism. A torsion spring is mounted on one leg of a pinlike fastening device which holds components of the readout mechanism such as the crank assembly of the scale lever system to the framework thereof, with the legs of the torsion spring being biased against other portions of the lever assembly framework in such a fashion as to urge the pinlike elements of the zero adjust lever and the pin fasteners for the bellcrank system against one side of the openings provided therefor in the framework and linkage and thereby eliminate relative movement of these components within the openings.

3,589,461

PARKING DEVICES FOR MOTOR ROAD VEHICLES

Archibald J. Butterworth, Frimley, Camberley, England, assignor to Sidler Limited, Camberley, England

Filed Sept. 9, 1968, Ser. No. 758,487
Claims priority, application Great Britain, Sept. 15, 1967, 42,227/67; 42,228/67
Int. Cl. B60k 25/08; B60s 9/20
U.S. Cl. 180—1 AW 5 Claims



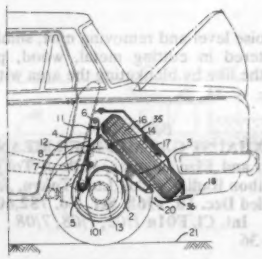
This invention relates to parking apparatus for motor vehicles of the kind wherein ground-engaging rollers are mounted at the ends of pivotal arms and in the lowered position raise a pair of the road wheels from the ground so that an adjacent end of the vehicle can move sideways. The invention particularly relates to an adjustable connection of the arms to the vehicle and to a construction of a two-stage hydraulic ram for actuating the apparatus.

3,589,462

MOTOR VEHICLE PARKING MECHANISM

Masakazu Inagaki, No. 18, Honzin Dori, 4-Chome, Nakamura Ku, Nagoya, and Jo Tsuda, No. 1066, Aza Taido, Oaza Kita-Mazima, Oharu Mura, Ama-gun Aichi-Ken, both of, Japan

Filed Sept. 10, 1968, Ser. No. 758,917
Int. Cl. B60k 7/00; B62d 43/06
U.S. Cl. 180—1 3 Claims



Mechanism for moving a vehicle laterally within a space corresponding to the length of the vehicle, for easy parking thereof. A pivotally mounted leg on the vehicle rotatably supports motor-driven spare wheel and tire. The leg is pivotally operable from a raised position, in which the spare tire is housed in the rear of the vehicle and, to a lowered position in which the tire engages a surface and raises the rear end of the vehicle in condition for moving the vehicle rear laterally. A hooked lift member is supported on the leg and is rendered effective automatically, as the support leg is lowered and raised, to engage the rear axle housing to support the arch of the vehicle so that the rear wheels are lifted with the vehicle as it is raised.

3,589,463

DUAL BELT VEHICLE

Robert W. Stowers, 7115 North Barnett Lane, Milwaukee, Wis.

Filed Sept. 3, 1969, Ser. No. 854,924
Int. Cl. B62m 27/02
U.S. Cl. 180—5 R 16 Claims

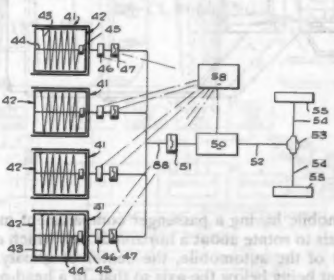
A vehicle propelled by two endless belts, one on each side of the machine, that pass around rolls at the front and rear of the machine. A pair of rolls at the front have canted axes, in a vertical, transverse plane, that are downwardly convergent, and a pair of rolls at the rear have canted axes, also in a vertical, transverse plane, that are upwardly convergent. Each belt passes between and around a front roll and a rear roll, and is in the form of a moebius with the twist of the moebius in the upper run of the belt. A prime mover is mounted toward the rear of the machine between the two belts and is in driving connection with the rear rolls. An upper deck includes a seat located over the prime mover and is provided with footboards at the front sides, so that the operator sits astraddle the machine and through controls on handrails beside the seat is able to maneuver it at desired speed.

3,589,464

SPRING-POWERED MECHANISMS

Atanas S. Katchamakoff, 8530 Louise Ave., Northridge, Calif.

Filed Dec. 12, 1968, Ser. No. 783,363
Int. Cl. B60k 9/02
U.S. Cl. 180—54 7 Claims



A spring-containing power cartridge for use in powering various mechanisms, including vehicles, equipped to receive one or more such cartridges and utilize the same as a replaceable power source.

3,589,465

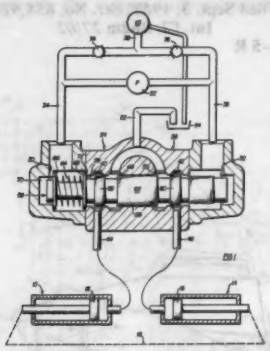
POWER STEERING SYSTEM

Ray S. Harding, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed July 22, 1969, Ser. No. 843,630
Int. Cl. B62d 5/08
U.S. Cl. 180—79.2 4 Claims

The power steering system incorporating a steering motor,

which is operated by a steering pump and a control valve so as to be always energized when steering a neutral course, thus increasing the responsiveness of the system.



3,589,466

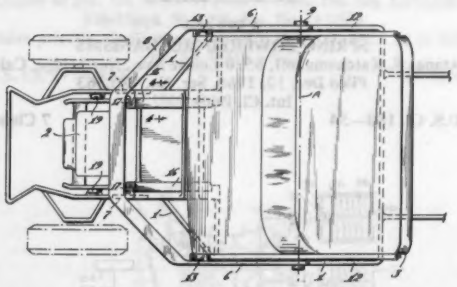
AUTOMOBILE SAFETY CONSTRUCTION FOR HEAD-ON COLLISION

Walter E. Dudley, 377 Granville Road, North Granby, Conn.

Filed Dec. 9, 1968, Ser. No. 782,050

Int. Cl. B60r *21/00*

U.S. Cl. 180—82 **8 Claims**



An automobile having a passenger compartment mounted on the chassis to rotate about a horizontal axis which extends transversely of the automobile, the center of gravity of the compartment being below the axis so that, in a head-on collision, the inertia of the compartment tends to rotate the passengers forwardly and upwardly about the aforesaid axis, and means for mounting the engine so that, when torn loose, it is directed downwardly and rearwardly under the passenger compartment.

3,589,467

AIR CUSHION VEHICLE

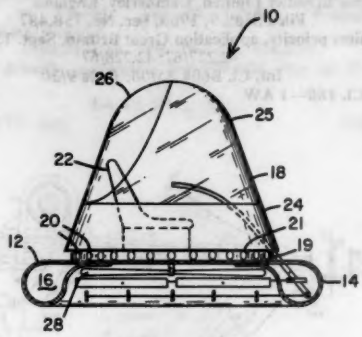
Donald C. Swendsrud, 849 Oriole Drive, Rosemount, Minn.

Filed June 20, 1969, Ser. No. 835,042

Int. Cl. B60v *1/14*

U.S. Cl. 180—117 **2 Claims**

An air cushion supported vehicle whose direction of motion is controlled by a set of vanes arranged in a grid to deflect the air produced by a motor driven fan is described. The positioning of the vanes in the grid is accomplished by the operator's control lever located within the operator's compartment.



3,589,468

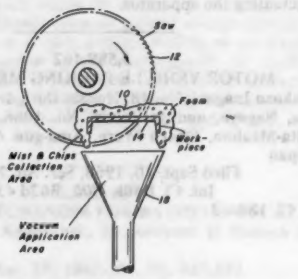
NOISE SUPPRESSION IN CUTTING OPERATIONS

Harry H. Rowand Jr., Oakmont, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 3, 1970, Ser. No. 25,328

Int. Cl. B26d *7/08*; **B27b** *5/38*

U.S. Cl. 181—33 **8 Claims**



Reducing noise level and removing mist, smoke, fumes and chips encountered in cutting metal, wood, plastics, glass, ceramics and the like by blanketing the area with foam.

3,589,469

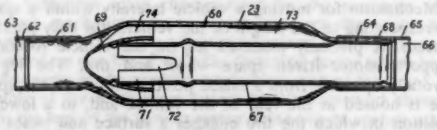
EXHAUST GAS MUFFLER MEANS

Hiroshi Hasui, and Eizo Suyama, both of Tokyo, Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1968, Ser. No. 782,607

Int. Cl. F01n *1/02, 1/08, 7/08*

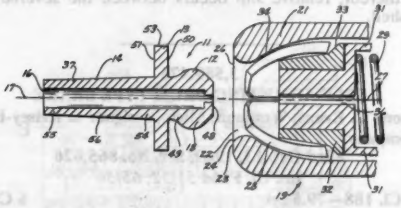
U.S. Cl. 181—36 **17 Claims**



An exhaust gas muffler means adapted to be provided in a gas exhaust pipe of the internal combustion engine and the like, comprising a series of buffing elements arranged in and along the gas exhaust pipe. Each buffing element comprises a

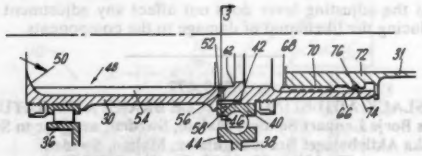
blind chamber, a throat and a plurality of outlets. The buffing elements are communicated with one after another intermediate a part of the gas exhaust pipe or directly. Not only the barking sounds but also low frequency noise are damped and deadened.

3,589,470
GREASE GUN ADAPTER
Chester Dorn, Spencer, Iowa, assignor to Superior Manufacturing Company, Spencer, Iowa
Filed Sept. 24, 1969, Ser. No. 860,773
Int. Cl. F16n *21/04*
U.S. Cl. 184—1 D 3 Claims



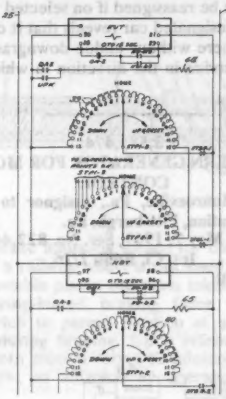
A grease gun adapter is provided which is mateable with a conventional grease gun coupler and frictionally engageable with a needle adapted for insertion into sealed lubricating areas. The adapter comprises a ball-shaped rearward portion mateable with the coupler, a flange rigidly affixed to the ball-shaped portion and juxtaposable with the coupler, and a tube affixed to the flange and frictionally engageable with the needle. An aperture is formed along the longitudinal axis of the adapter through the tube, the flange, and the ball-shaped portion thereby allowing grease to flow from the grease gun, through the adapter and the needle, and into the sealed lubricating areas.

3,589,471
SPLINE LUBRICATION FROM RESERVOIR
Robert G. Edge, Aliestree, Derby, England, assignor to Rolls-Royce Limited, Derby, England
Filed Mar. 7, 1969, Ser. No. 805,147
Claims priority, application Great Britain, Mar. 29, 1968, 15286/68
Int. Cl. F16n *7/36*; F02c *7/06*
U.S. Cl. 184—6 6 Claims



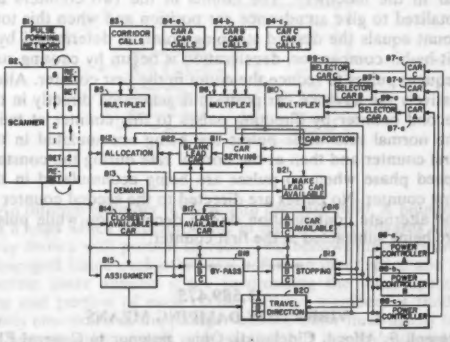
A lubricated drive system for an accessory of a gas turbine engine which includes means for intermittently lubricating a splined interconnection between two shafts as well as means for lubricating a bearing for the shafts. Lubricant is supplied to an annular reservoir within one shaft, and this reservoir is kept full by centrifugal force when the shaft is rotating. During this period of rotation at a predetermined minimum speed, the excess lubricant supplied to the reservoir is discharged therefrom onto the bearing for the shaft or shafts, and when rotation of the shaft reduces below the minimum value or stops, the predetermined amount of lubricant within the annular reservoir spills therefrom onto a splined interconnection between the shafts so that it can centrifuge into the splines when rotation of the shafts begins.

3,589,472
ELEVATOR SYSTEM
Alan M. Hallene, Moline, and John J. Drexler, Milan, both of, Ill., assignors to Montgomery Elevator Company
Continuation of application Ser. No. 265,239, Mar. 14, 1963, now abandoned. This application Oct. 16, 1967, Ser. No. 676,014
Int. Cl. B66b *1/20*
U.S. Cl. 187—29 13 Claims



A dispatching control for elevators in which traffic is measured in terms of door open time for cars traveling between the terminals. The door open time of up traveling cars is balanced against the door open time of down traveling cars for a comparison time interval, and, if there is an unbalance of door open time, the terminal time at one terminal is adjusted to maintain substantially even car spacing.

3,589,473
PULSE-SUPERVISED MULTIVEHICLE TRANSPORTATION
Andrew F. Kirsch, Edison; Henry C. Savino, Hackensack, N.J., and Gary D. Frey, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., by said Kirsch and Savino
Filed Dec. 17, 1968, Ser. No. 806,761
Int. Cl. B66b *1/20*
U.S. Cl. 187—29 R 46 Claims



A multicar elevator supervisory system wherein a pulse driven scanner rapidly and continuously scans up and down in the order of the landings for the presence of car position signals, car call signals and corridor call signals. Solid-state logic circuits process the car position and call signals to generate control signals. A predetermined number of car

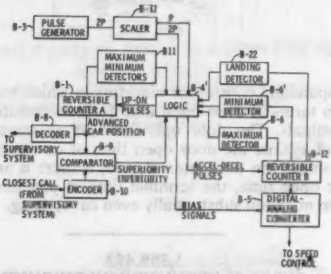
calls and corridor calls are allocated to each car in accordance with a scheme which takes into account factors such as coincidence of car and corridor calls, the distance between cars and distance between calls. Such allocation of calls is reevaluated on each scan so that calls are distributed between the cars in accordance with the instantaneous traffic situation. The closest available car is assigned to satisfy a demand for an extra car which is created by the presence of more than the predetermined number of calls per car serving in a given direction or for calls which no car is in position to answer. A car can be reassigned if on selected scans tentative disregard of the designated car reveals that it can be released for service elsewhere without undue downgrading of service to the calls for service in the direction in which it was serving.

3,589,474

DIGITAL PATTERN GENERATOR FOR MOTOR SPEED CONTROL

Andre Wavre, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1969, Ser. No. 822,447
Int. Cl. B66b *1/16*
U.S. Cl. 187—29 R **23 Claims**



A speed reference signal for an elevator speed control is generated by a nonlinear digital to analog converter as a function of the accumulated count in a first reversible digital counter of pulses representative of increments of displacement between the car and the hatchway. The accumulated count is limited to a predetermined maximum corresponding to a desired maximum speed. A second reversible counter maintains a running count proportional to the position of the car in the hatchway. The counts in the two counters are totalized to give an advance car position and when this total count equals the desired stopping point, as determined by a bit-by-bit comparator, deceleration is begun by causing subsequent pulses to reduce the count in the first counter. Alternatively the advance car position is generated directly in the second counter by directing pulses to this counter at twice the normal rate while pulses are being accumulated in the first counter and then at the normal rate during the constant speed phase when no pulses are being accumulated in the first counter. No pulses are directed to the second counter in the alternate configuration during deceleration while pulses are being subtracted in the first counter.

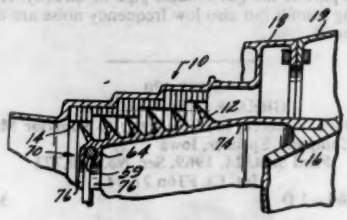
3,589,475

VIBRATION DAMPING MEANS

Joseph S. Alford, Cincinnati, Ohio, assignor to General Electric Company

Filed Jan. 2, 1969, Ser. No. 788,541
Int. Cl. F16f *7/10*
U.S. Cl. 188—1 B **11 Claims**

Vibration damping means for a thin-walled shell member are disclosed wherein a severed ring frictionally engages and grips the shell so that during flexural vibration of the shell, which is characterized by flexural waves propagating in either the axial or circumferential direction, or a combination thereof, relative slip occurs between the severed ring and shell.



3,589,476

SELF-ADJUSTING DRUM TYPE BRAKE

Anthony C. Evans, Westland, Mich., assignor to Kelsey-Hayes Company

Filed Oct. 13, 1969, Ser. No. 865,626
Int. Cl. F16d *51/52, 65/56*
U.S. Cl. 188—79.5 **6 Claims**

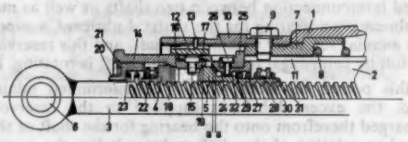
a drum-type brake embodying a self adjusting mechanism. The self adjusting mechanism includes an adjusting lever that is pivotally supported upon a supporting lever which is, in turn, pivotally supported upon the web of one of the brake shoes. During normal adjusting procedure, the adjusting lever pivots relative to its supporting lever to accomplish the adjustment. If for some reason the adjusting mechanism binds, both the adjusting lever and the supporting lever will pivot so that the adjusting lever does not affect any adjustment thus reducing the likelihood of damage to the components.

3,589,477

SLACK ADJUSTING VEHICLE BRAKE APPARATUS

Nils Borje Lennart Sander, Malmo, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Nov. 20, 1968, Ser. No. 777,357
Claims priority, application Great Britain, Nov. 23, 1967, 53,380/67
Int. Cl. F16d *65/66*
U.S. Cl. 188—196 **2 Claims**



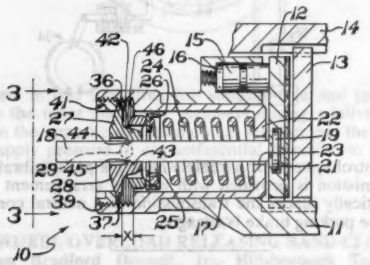
A vehicle automatic slack adjuster has a feeder nut rotatable on a threaded spindle which has axial teeth engaging a movable control member clutch surface to prevent rotation

when brakes are released. A stop engages the control member to release the clutch and thereafter to move it into position to compress a spring transmitting a force to the nut to cause rotation during brake application when slack occurs thereby to effect slack adjustment automatically.

3,589,478
BRAKE RETRACTOR MECHANISM

C. Lucas Plaat, Troy, and Richard E. Frazier, Pleasant Hill, both of, Ohio, assignors to The B.F. Goodrich Company, New York, N.Y.

Filed Aug. 27, 1969, Ser. No. 853,408
Int. Cl. F16d *65/54, 55/18*
U.S. Cl. 188—196 10 Claims

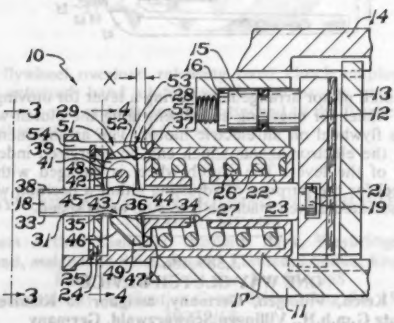


A brake retractor assembly in which a pair of hinged clamping levers grip the retractor rod on opposite sides as a result of pressure exerted against the ends of the levers by the retractor spring. The clamping pressure against the rod is released after the rod is moved beyond the normal brake release clearance distance by actuation of the other ends of the levers whereby the spring force is overcome by the brake actuating force.

3,589,479
BRAKE RETRACTOR MECHANISM

C. Lucas Plaat, and Arthur J. Thrower, both of Troy, Ohio, assignors to The B.F. Goodrich Company, New York, N.Y.

Filed Sept. 5, 1969, Ser. No. 855,498
Int. Cl. F16d *65/54, 55/18*
U.S. Cl. 188—196 4 Claims

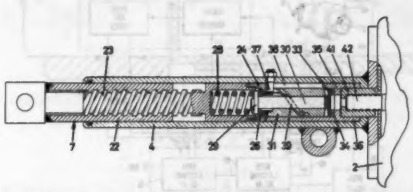


A brake retractor assembly in which the automatic adjustment mechanism includes a locking plate assembly for gripping the retractor rod in a tilted position and a friction engaging member carried by the locking plate for relative rotational movement therewith so that the friction engaging face of this member conforms to the face of the retractor rod.

3,589,480
RAILWAY DISC BRAKE

Lars B. Axelsson; Kaj A. Lilja, and Sten-Eric Svensson, all of Malmo, Sweden, assignors to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Sept. 24, 1969, Ser. No. 860,613
Claims priority, application Great Britain, Sept. 27, 1968, 45,900/68
Int. Cl. F16d *65/66*
U.S. Cl. 188—203 S 10 Claims

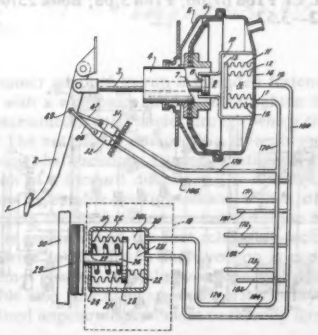


Automatic brake adjusting means for disc brakes, on opposite sides of a railway wheel is disclosed, having two telescopically adjustable piston rod parts taking up slack in the rigging. A spring-biased braking force threshold means operates a clutch to permit rotation of a sleeve having a spiral groove during braking. Upon release of braking the sleeve in a return motion serves to telescopically adjust the piston rod parts, as afforded by operation of a one-way clutch.

3,589,481
BRAKE SYSTEM

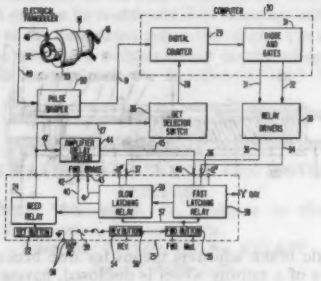
Alfons Motsch, Bergneustadt, and Gerhard Mohn, Bergneustadt-Hackenberg, both of, Germany, assignors to Dr. Hermann E. Muller, Bez, Cologne, Germany

Filed June 5, 1969, Ser. No. 830,695
Claims priority, application Austria, June 11, 1968, 5,566/68
Int. Cl. B60t *11/24*
U.S. Cl. 188—345 9 Claims



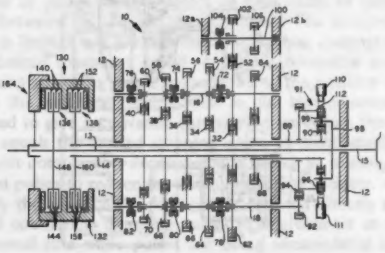
An internal chamber is filled with pressure fluid. A plunger has a head which is reciprocable in the chamber towards and away from a wall portion thereof. Two bellows members are telescoped inside each other and define an inner space and a discrete outer annular space surrounding the inner space. One end portion of each of the bellows members is fluid-tightly connected to the plunger and the other fluid-tightly to the aforementioned wall portion. Conduit means leading to the wheel to be braked is provided in form of two conduits one of which communicates with the inner space and the other of which communicates with the outer annular space. Both spaces are filled with fluid. When the plunger is reciprocated towards the wall portion, the fluid is compressed and ejected into the conduit means for activating the brake or brakes associated with the conduit means and with the wheel or wheels which are to be braked.

3,589,482
AIR OPERATED MOTOR AND BRAKE WITH MODULATING CONTROL SYSTEM
Clement Walker Weston, Jr., New Orleans, La., assignor to Corinth Machinery Company, Inc., Corinth, Miss.
Filed Nov. 5, 1969, Ser. No. 874,285
Int. Cl. F16d 67/00
U.S. Cl. 192—3 R 8 Claims



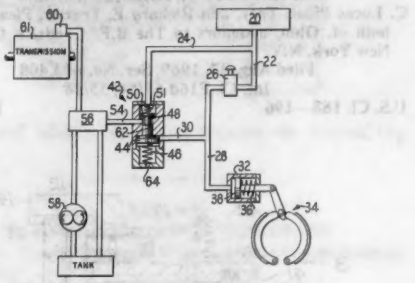
A computerized electronically controlled setworks contains an air motor for driving the set shaft and an airbrake for such shaft. The airbrake for the set shaft has its operation modulated during deceleration so that with a large heavy log, deceleration will be relatively little whereas with a lighter log, deceleration will be relatively great. This modulation of the brake is accomplished by detecting speed according to the volume of exhaust air flowing from the air motor. A back pressure is imposed upon the motor which provides simulated loading of the system when activation of the airbrake is desired.

3,589,483
VARIABLE SPEED TRANSMISSION
Paul J. Smith, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio
Filed Jan. 27, 1970, Ser. No. 6,101
Int. Cl. F16d 67/00; F16h 3/08; B60k 23/00
U.S. Cl. 192—3.52 26 Claims



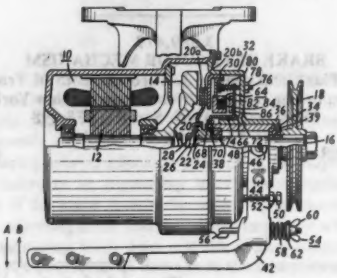
A transmission having an elongated input shaft with a plurality of input gears unitarily rotatable therewith, and having a pair of countershafts, with each countershaft having a free running gear thereon, and with each countershaft gear meshing with an input gear. A planetary gearset is connected to receive power from the countershafts and provide a collected common output. An input member includes a pair of friction clutches, one clutch for connecting the input member to the input shaft, and the other clutch for connecting the input member to a through shaft which is connected to the common output. The countershaft carries gear clutches for selectively connecting the countershaft gears thereto, and a braking arrangement is provided to hold the ring gear of the planetary gearset stationary. A semiautomatic control system controls the operation of the various clutches and the braking arrangement to shift the transmission.

3,589,484
PARKING BRAKE CONTROL SYSTEM
Edward J. Lammers, and Thomas F. Teter, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed July 16, 1969, Ser. No. 842,267
Int. Cl. F16h 57/10
U.S. Cl. 192—4 A 3 Claims



A control system for a vehicle having a parking brake and a transmission is provided with a valve arrangement which automatically places the transmission in a neutral condition when the parking brake is engaged.

3,589,485
CLUTCH MOTOR
Sadayuki Kajitani, and Masahiro Yokoyama, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabusniki Kaisha, Tokyo, Japan
Filed July 9, 1969, Ser. No. 840,152
Claims priority, application Japan, July 12, 1968, 43/59362
Int. Cl. F16d 13/22
U.S. Cl. 192—18 B 7 Claims

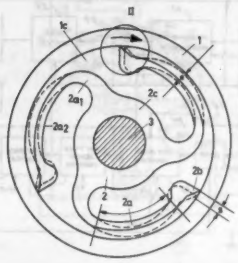


A clutch motor arrangement having a lever for moving the clutch wheel for engaging and disengaging the clutch wheel from a flywheel on an electric motor. The arrangement includes the electromagnets which can be energized independently of the lever. The clutch wheel is engaged with the flywheel for the purpose of adjusting either a position where the associated driven machine is to stop or its speed.

3,589,486
ONE WAY CLUTCH DEVICE
Heinz Kelch, Villingen, Germany, assignor to Kienzle Apparate G.m.b.H., Villingen,Schwarzwald, Germany
Filed July 15, 1969, Ser. No. 841,773
Claims priority, application Switzerland, July 19, 1968, 10,833/68
Int. Cl. F16d 41/18; G07b 13/04
U.S. Cl. 192—46 8 Claims

A one way clutch device has an annular outer member with inner ratchet teeth, and an inner member having a plurality of resilient arms with pawl end portions which resiliently engage the ratchet teeth and recesses of the outer

member. Each arm has an elongated thin portion extending substantially in circumferential direction along the ratchet teeth so that the arms can be bent by the ratchet teeth in radial direction during relative turning of the inner and outer



members in one direction, but slippage-free and resiliently couple the inner and outer members during relative movement in the opposite direction due to the fact that the ratchet teeth apply pressure in circumferential direction to the circumferentially extending arm portions.

3,589,487

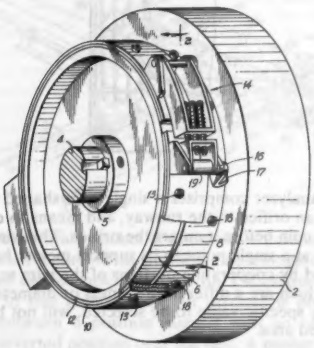
FLYWHEEL OVERLOAD RELEASING BAND CLUTCH

Emerson Bradford Donnell, Jr., Hillsborough Township, Somerset Co., N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,676

Int. Cl. F16d *43/20, 13/10*

U.S. Cl. 192—56 **8 Claims**



A flywheel overload releasing band clutch employing a lever-actuated band clutch which clamps on two equal diameter concentric drums, one attached to the flywheel and the other attached to the flywheel shaft.

3,589,488

SYNCHRONOUS SELF-SHIFTING CLUTCH WITH YIELDING MEANS

Herbert Arthur Clements, Oatlands Park, Weybridge, England, assignor to S.S.S. Patents Limited, London, England

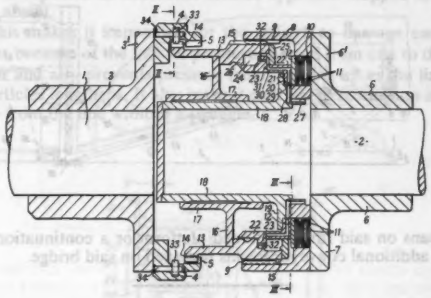
Filed July 23, 1969, Ser. No. 844,068

Claims priority, application Great Britain, Aug. 16, 1968, 39373/68

Int. Cl. F16d *23/02*

U.S. Cl. 192—67 **4 Claims**

In a synchronous self-shifting clutch comprising a toothed intermediate member constrained for helical movement into and out of toothed engagement with another clutch part, a system of Belleville washers serves as a stop under conditions of normal positive torque to prevent relative axial movement of the toothed intermediate member and the said toothed clutch part beyond their relative axial positions of normal toothed interengagement. Under a predetermined excessive positive torque overload the Belleville washers yield so as to



permit relative axial movement of the said toothed parts beyond their normal positions of toothed interengagement whilst still remaining in toothed interengagement.

3,589,489

DRIVE FOR NUT RUNNERS WITH AUTOMATIC STOP

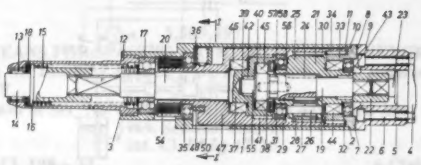
Herbert Fehlings, Wiesbaden, Germany, assignor to Pressluftwerkzeug und Maschinenbau PREMAG G.m.b.H., Geisenheim/Rhine, Germany

Filed Apr. 30, 1969, Ser. No. 820,605

Claims priority, application Germany, May 2, 1968, P 17 03 316.8

Int. Cl. F16d *71/00*; F16h *5/72*; B25b *17/02*

U.S. Cl. 192—139 **11 Claims**



A nut runner adapted to run a threaded fastener into engagement with a workpiece, and then to tighten it to a final torque, determined by the angle through which the fastener is rotated. The nut runner comprises a reversible motor driving a driving shaft section. During rotation of the driving shaft section in a forward direction, it is directly connected through first releasable locking means with a driven shaft section driving the tool. When an initial torque is reached, the motor is reversed and the first releasable locking means released. Drive to the driven shaft section is continued via sun-and-planet gearing, the tubular sun gear of which carries an adjustable stop which engages with a stationary stop after predetermined angular displacement to thereby terminate the process.

3,589,490

APRON TRANSLOADING DEVICE FOR AN AIR FREIGHT TRANSLOADING STATION

Kalus Walkhoff, and Owe Lichtenford, both of Essen-Werden, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 14, 1969, Ser. No. 841,224

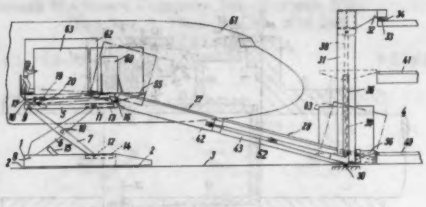
Claims priority, application Germany, Aug. 6, 1968, P 17 56 943.6

Int. Cl. B65g *13/00*

U.S. Cl. 193—35 **10 Claims**

Apron transloading device for air freight with a platform which is adjustable as to height and which comprises conveyor means while a bridge with further conveyor means is pivotally connected to said platform. Also pivotally con-

nected to said platform is a tiltable platform which is adjustable selectively so as to form a continuation of the conveyor



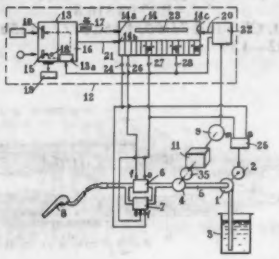
means on said first mentioned platform or a continuation of an additional conveyor means provided on said bridge.

3,589,491

PREPAYMENT DEVICE FOR THE REMOTE CONTROL OF A DISPENSER

Edouard DeCrepy, Paris, France, assignor to Societe Anonyme Francaise des Appareils Automatiques Taximetres-Taxiphones S.A.F.A.A., Paris, France

Filed July 9, 1969, Ser. No. 840,340
Claims priority, application France, July 10, 1968, 158,611
Int. Cl. G07f *13/00*
U.S. Cl. 194—5 **8 Claims**



A prepayment device for the remote control of an apparatus for dispensing a product, notably liquid fuel, comprising a pulse emitter driven from a volumetric counter and producing a number of pulses proportional to the quantity of product delivered by an apparatus, and a remote control unit comprising essentially a money-collecting device adapted to receive coins and/or banknotes, and emitting at its output end electric pulses, the number of which corresponds to the monetary value of the coins and/or banknotes introduced into said collecting device, and a counter having two progression directions and comprising a first counting input connected to the output of said collecting device, and a second reverse counting input connected to the output of the emitter driven from the volumetric counter of the dispensing apparatus.

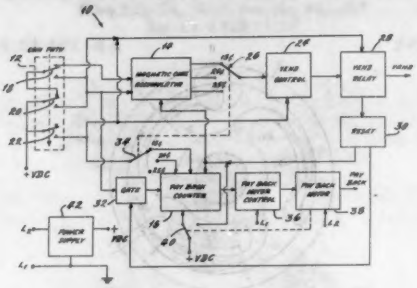
3,589,492

MAGNETIC CONTROL MEANS FOR VENDING MACHINES AND THE LIKE

John R. Shirley, Crestwood, Mo., assignor to H. R. Electronics Company, High Ridge, Mo.

Filed Apr. 1, 1969, Ser. No. 811,802
Int. Cl. G07f *11/00*
U.S. Cl. 194—10 **25 Claims**

Magnetic and electronic control means for vending machines and other coin control devices which accept different denomination coins, make vends at selectable prices and perform other functions including making change, said control means including counting and memory means and means under the control thereof for producing the vending, change making and other functions. The subject means are



preferably constructed using solid state and magnetic core components.

3,589,493

COIN ANALYZER WIRE RUNWAY

Mitchell A. Hall, Ft. Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

Filed Mar. 26, 1969, Ser. No. 810,643
Int. Cl. G07f *3/02*
U.S. Cl. 194—102 **26 Claims**

A coin analyzer comprises a single wire shaped to provide a runway, an orifice to the runway, and means to control the speed of a coin before it enters the orifice. The wire, which is connected at a single point to its support means, has the runway formed by cooperating portions of the wire so that coins or slugs, which are a different thickness or diameter than the coin of the specific value to be selected, will not be directed to a selected area.

3,589,494

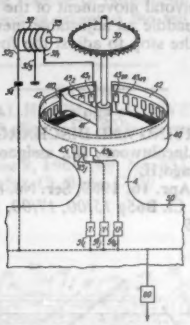
KEYBOARD PRINTER WITH CONTINUOUSLY ROTATING TYPE MEMBER

Paul F. Gloess, 114 avenue Andre Marizet, Boulogne-Billancourt, France

Filed Apr. 23, 1969, Ser. No. 818,626
Claims priority, application France, Apr. 23, 1968, 149,142
Int. Cl. B41j *1/30*
U.S. Cl. 197—18 **4 Claims**

A keyboard printer for use as a peripheral element of a computer in which the codes of the characters are pulses exhibiting with respect with a start pulse variable discrete phase shifts. This printer comprises means for continuously rotating first and a second wheels and a rotative arm carrying a mobile electrode. The first wheel has one magnetic tooth and the second wheel has a plurality of magnetic teeth, as many as characters on a rotative character wheel also driven by the same shaft as the two wheels and the arm. A pulse distributor comprises a common electrode and individual character electrodes. The keys are formed by two adjacent key electrodes which exhibit a small capacitance when not touched and a large capacitance when touched by the operator's finger tips.

The common electrode is connected to the winding of an electromagnet cooperating with the second wheel. The individual character of electrodes are respectively connected to one electrode of the keys and the second electrodes of the keys are connected to the output of the printer.



3,589,495

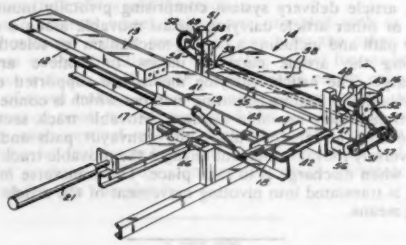
BRICK MAKING MACHINE

Florentin J. Pearne, Whittier; Frank S. Pearne, San Gabriel, and Frederick G. Robson, Long Beach, all of, Calif., assignors to Aircraft Mechanics, Inc., Los Angeles, Calif.

Continuation-in-part of application Ser. No. 478,913, Aug. 11, 1965, now Patent No. 3,478,397. This application Aug. 18, 1969, Ser. No. 850,849

Int. Cl. B65g *57/08*

U.S. Cl. 198—33 **21 Claims**



An automated brick hacker is disclosed which includes an inverter stacker operable to position one elongated cut or uncut slug of unfired brick material on a subsequent cut or uncut slug. In one embodiment, an inverter is pivoted for movement between a position aligned with an off-bearing belt and an inverted position over the belt. A pusher operates to slide alternate slugs from the off-bearing belt onto the inverter. Vacuum means grip the slug while it is inverted and positioned over the subsequent slug on the off-bearing belt. In another embodiment, an inverter stacker is provided which is operable to grip lateral sides of a slug along its length and raise the slug for positioning on a subsequent slug with or without inversion. A pusher drivingly engages the rearward end of a cut slug for movement into the inverter and spaces adjacent slugs without creating spaces between bricks in the slug. A pneumatic gripper is provided to gently, but securely, grip a plurality of bricks for transfer from one location to another.

3,589,496

ARTICLE ACCUMULATION CONVEYORS

John M. Leach, P.O. Box 341, Port Jefferson, N.Y.

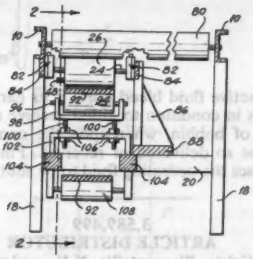
Filed Feb. 14, 1969, Ser. No. 799,366

Int. Cl. B65g *13/07*

U.S. Cl. 198—34 **11 Claims**

This invention relates to an article handling conveyor of the accumulation-type which means that whenever an article is stopped from movement thereon, the article following is automatically also stopped at a point where it can not exert any sizeable force against the first stopped article and this action is repeated as additional articles approach stopped articles ahead.

This makes it impossible for the articles to damage each other because of the lack of pressure exerted from one to the other and also prevents pressure from building up as the line of articles lengthens. It also make it possible to remove an article from the line without a struggle.



The power source is a constantly moving beltlike member or band from which power is taken off to move the articles and released to stop the articles. The power takeoff and release mechanism is characterized by its ability to operate without ever disturbing the position of the band laterally of its normal path of movement which reduces wear on the band, enables it to run smoothly, reduces noise, and does not disturb the tracking of the band.

3,589,497

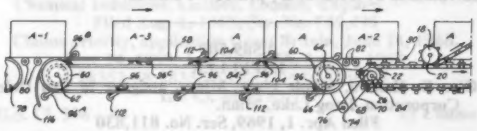
MEANS FOR SPACING ARTICLES ON A CONVEYOR

John M. Leach, P.O. Box 341, Belle Terre, Port Jefferson, N.Y.

Division of Ser. No. 682,239, Pat. No. 3,481,449. Filed Apr. 17, 1969, Ser. No. 816,999

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **6 Claims**



The present invention provides a process and apparatus for conveying individual articles along a path which changes substantially vertically from one elevation to another and at a high speed where desired, and also receiving articles random spaced and moving them into a uniform spacing pattern so that they can be accurately fed into a further moving operation in a different direction without ever being stopped or having the relative travel positions of the articles changed.

3,589,498

BOBBIN HANDLING SYSTEM

Larry C. Cowan, Jamestown, and David G. Cruickshank, North Kingstown, both of, R.I., assignors to Leesona Corporation, Warwick, R.I.

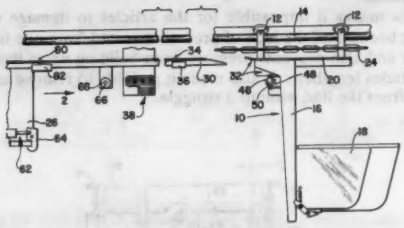
Filed Sept. 18, 1969, Ser. No. 859,151

Int. Cl. B65g *43/00*

U.S. Cl. 198—38 **11 Claims**

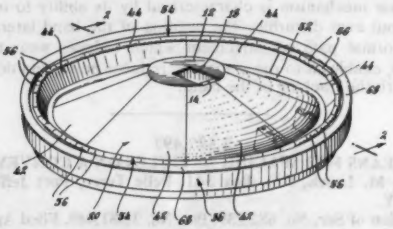
A bobbin handling system in which bobbin carriers of an overhead conveyor receive various types of bobbins from delivery stations and deliver the bobbins to receiving stations.

A control system includes a stationary fluid operated control unit at each of the stations and actuators for the control units on each of the carriers. As an actuator passes a control unit it causes operating fluid to be supplied to the control unit and



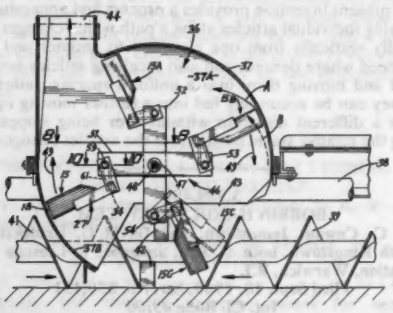
then closes active fluid bleed ports if its carrier and the station are both in condition to either receive or deliver a particular type of bobbin, whereupon the control unit causes bobbins to be so delivered or received. Finally, the passing actuator causes the operating fluid to be shut off.

3,589,499
ARTICLE DISTRIBUTOR
Nicholas G. Cristy, Pleasantville, N.Y., assignor to The Macton Corporation, Danbury, Conn.
Filed Mar. 10, 1969, Ser. No. 805,576
Int. Cl. B65g *37/00*
U.S. Cl. 198—103 **9 Claims**



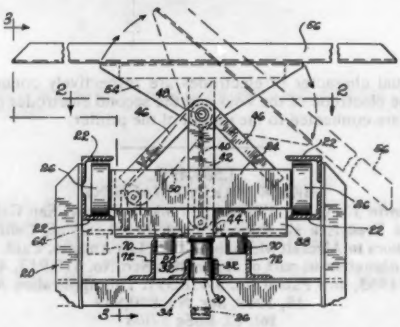
A baggage turntable is molded in true conical form from reinforced fiber glass. The integral outer wall is normal to the conical surface and along its inner rim is a resilient bumper formed of a plurality of cylindrical rollers. The turntable is surrounded by a stationary protective shroud.

3,589,500
IMPELLER
Glen D. Hansen, Maple Plain, Minn., assignor to Van Dale Corporation, Long Lake, Minn.
Filed Apr. 1, 1969, Ser. No. 811,830
Int. Cl. B65g *31/00*
U.S. Cl. 198—128 **21 Claims**



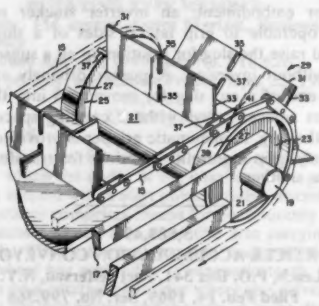
An impeller for moving particulate material having a power driven rotor pivotally carrying a plurality of impeller paddles. Each paddle has a paddle portion and an arm pivotally connected to the rotor at a location substantially forward of a longitudinal line through the center of gravity of the paddle portion. A stop on the rotor coacts with the arm to limit forward pivotal movement of the paddle. In one embodiment of the paddle an adjustable member on the arm is engageable with the stop to adjust the forwardmost position of the paddle.

3,589,501
ARTICLE CARRYING AND DISCHARGE MECHANISMS
John Harrison, Lincolnwood, Ill., assignor to The Spra-Con Company, Chicago;IL
Filed Apr. 16, 1969, Ser. No. 816,493
Int. Cl. B65g *15/00, 17/00, 19/00*
U.S. Cl. 198—155 **22 Claims**



An article delivery system comprising pivotally mounted trays or other article carrying means movable along a conveyor path and including a coding mechanism for selectively pivoting the article carrying means to achieve article discharge. The article carrying means are supported on a downwardly extending actuating member which is connected to a transversely movable element. Movable track sections are located at intervals along the conveyor path and the transversely movable element engages the movable track sections when discharge is to take place. The transverse movement is translated into pivoting movement of the article carrying means.

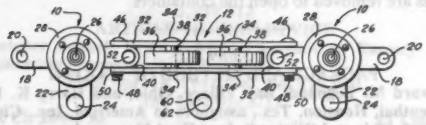
3,589,502
CONVEYOR
Emil J. Maillet, 402 Lucas; Karl L. Zamberletti, R. R. #1, both of Danville, Ill., and Ebert O. Lovett, 305 Merrill, Catlin, Ill.
Filed Apr. 10, 1969, Ser. No. 815,100
Int. Cl. B65g *19/00*
U.S. Cl. 198—172 **1 Claim**



A chain driven conveyor apparatus. A drive end and a tail end, sprocket wheels at the drive end and wheels at the tail end having peripheries of greater width than the chains and

of uniform circumferential and transverse continuity over which the chains travel. A plurality of flights pivotally connected at each end to a chain, and means at the tail end of the conveyor limiting transverse movement of each flight as it reverses its direction of travel at the tail end of the conveyor.

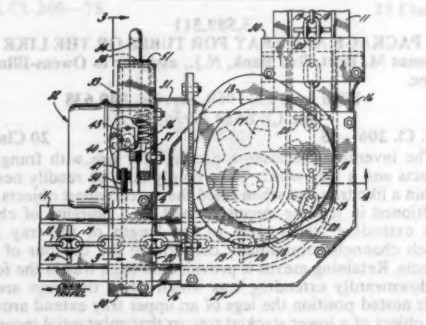
3,589,503
MATERIAL HANDLING CONVEYORS
John M. Leach, P.O. Box 341, Belle Terre, Port Jefferson, N.Y.
Filed June 9, 1969, Ser. No. 831,382
Int. Cl. B65g *17/20*
U.S. Cl. 198—177 **7 Claims**



The present invention relates to endless conveyors frequently used for carrying objects overhead and of the enclosed track type in which the track is a four-sided box in cross section usually square or slightly rectangular. The trolleys which run inside the track are alternately provided with vertical wheels and horizontal wheels considered when the track is running horizontally. Hooks extend from the vertical wheel trolleys through a slot formed usually in the bottom section of the track and support the objects conveyed. The horizontal wheels contact one or the other of the vertical sections of the track and eliminate excessive rubbing friction between the trolleys and the track.

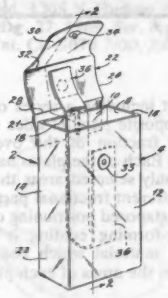
The horizontal wheel trolleys are provided with at least two horizontal wheels positioned one after the other or in tandem in the direction of the trolley travel for sequential contact with the track which on horizontal curves cause the ends of these trolleys to move away from the convex side of the curved track on the inside of the track, which action forces each vertical wheel trolley connected between two two-wheeled trolleys to be bodily moved away from and held out of contact with the convex side which eliminates all rubbing friction completely.

3,589,504
TORQUE LIMITING MEANS FOR CONVEYORS
Ronald S. Blough, Fairfield, Iowa, assignor to Fairfield Engineering and Manufacturing Co., Fairfield, Iowa
Filed Jan. 31, 1969, Ser. No. 795,533
Int. Cl. B65g *43/02*; **H02h** *7/08*
U.S. Cl. 198—232 **8 Claims**



A chain conveyor operating in a conveyor housing is driven by a rotatably mounted drive motor to exert a counter rotational reaction torque against a resilient stop element. When the reaction torque exceeds a preselected value, compression of the stop element trips a motor cutoff switch to stop the conveyor, which remains stopped until the switch is manually reset.

3,589,505
CIGARETTE CASE
Anthony J. Burniski, Warson Woods, Mo., assignor to Swank, Inc., Prince Gardener Division, St. Louis, Mo.
Filed Apr. 14, 1969, Ser. No. 815,830
Int. Cl. A24f *15/00*
U.S. Cl. 206—41.2 **5 Claims**



A cigarette case including a boxlike container portion and a closure flap overlying the open end of the container portion. A partition strap extends downwardly from the front wall of the container portion, loops across the interior thereof, and extends upwardly along the rear wall. The free upper end of the strap may be connected to either the upper end of the backwall or to the closure flap. When in the former position, the looped portion of the strap is against the bottom wall so that the container portion will accept cigarette packs of maximum length, whereas in the latter position the looped portion is above the bottom wall and the container portion accommodates packs of shorter length so that the cigarette in those shorter packs are easily accessible.

3,589,506
PLASTICS CONTAINERS AND PACKAGES
Andrew George Ford, Hitchin, and Ronald Augustus Hudson, Welwyn, Garden, both of, England, assignors to Imperial Chemical Industries, Limited, London, England
Filed Aug. 1, 1968, Ser. No. 749,496
Claims priority, application Great Britain, June 14, 1968, June 14, 1968, June 14, 1968, Aug. 1, 1967, 28352/68;28355/68;2835768;35336/67
Int. Cl. B65d *83/14*
U.S. Cl. 206—46 **15 Claims**

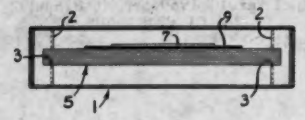
Plastics film container for contents under superatmospheric pressure, closed by a bunched neck provided with a sealable material forming an internal gasket, and an external mechanical closure, and with a releasably sealed tube passing through the bunched neck.

3,589,507

KIT FOR MAKING A PICTURE-DISPLAYING MURAL

Hoyne S. Greenberg, Beverly Hills, Calif., and Max L. Wexler, Chicago, Ill., assignors to Hoyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 8, 1969, Ser. No. 864,732
Int. Cl. B65d 79/00; B44f 1/00
U.S. Cl. 206—47 R 6 Claims



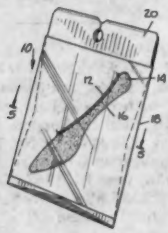
A do-it-yourself kit including a series of individual transparent plates with opposite parallel sides and each of a size constituting a small fraction of the overall mural to be fabricated therefrom. Each of the plates has deposited on the rear surface and in only selected areas thereof a pigmented material forming a different fractional part of an overall picture formed by the juxtaposed positioning of the plates in two directions. A mirror-forming coating is formed over the deposited pigmented material which coating forms a mirrored surface between the areas of each plate covered by the pigmented material.

3,589,508

HOSIERY DISPLAY PACKAGE HAVING TRANSPARENT PROTECTIVE SHEET

Stanley Burchett, c/o Burton Hosiery Mills, 350 Fifth Ave., New York, N.Y.

Filed Feb. 13, 1969, Ser. No. 798,903
Int. Cl. B65d 65/16
U.S. Cl. 206—45.33 2 Claims



A novel merchandise package is described. The package is formed of a unitary paper die cut. The die cut is provided with flaps which are attached to a central die cut section by spaced fold lines. The central section is provided with a slit for partial display of merchandise. A transparent sheet is provided on a side of the die cut over the central section and overlapping the fold lines to provide a desired stretching thereof upon completion of the assembly of the package with its merchandise.

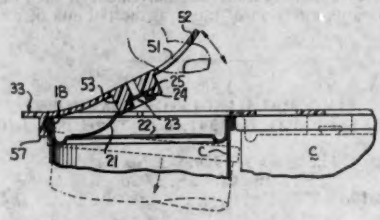
3,589,509

COMBINATION CARRIER AND CAN OPENER

Carmen T. Mascia, Westchester, and Harry Arnold Peyser, Olympia Fields, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 13, 1968, Ser. No. 783,678
Int. Cl. B65d 79/00, 71/00
U.S. Cl. 206—65 30 Claims

This disclosure relates to a carrier and a plurality of containers having ends provided with tear-out portions, the carrier being constructed from a plurality of interconnected pull tabs which are each joined to an associate tear-out portion of the container ends whereby upon applying a manual opening force through the pull tabs or the containers the tear-out portions are removed to open the containers.

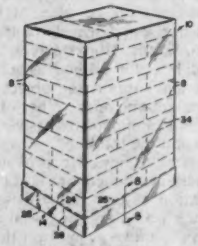


3,589,510

PACKAGE AND METHOD OF MAKING

Edward M. Begnaud, Bay Village, Ohio, and Harry K. Hubenthal, Houston, Tex., assignors to Ameripol, Inc., Cleveland, Ohio and Olinkraft, Inc., West Monroe, La., a part interest to each

Filed Apr. 28, 1969, Ser. No. 819,753
Int. Cl. B65b 53/00; B65d 71/00, 85/62
U.S. Cl. 206—65 2 Claims



A rectangular blank for forming a tray having a strip of adhesive along each of two parallel edges and a score line in said blank parallel to each edge, the score lines intersecting to form a rectangle. Four slits are cut in said blank, each extending from an edge to one of the four intersections of the rectangle formed by the fold lines.

A package comprising a tray having four vertical sides and a bottom, contents in said tray and a shroud extending over the contents. The shroud comprising a tube which may be closed at one end and extending down over the sides of the tray with the lower end of the shroud being bonded to adhesive material on the sides of the tray.

The method of forming the tray.

The method of forming the package.

3,589,511

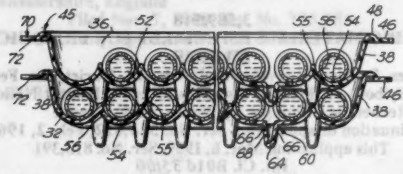
PACKAGE AND TRAY FOR TUBES OR THE LIKE

Thomas M. Britt, Red Bank, N.J., assignor to Owens-Illinois, Inc.

Filed Aug. 13, 1969, Ser. No. 849,638
Int. Cl. B65d 77/26, 25/10
U.S. Cl. 206—65 20 Claims

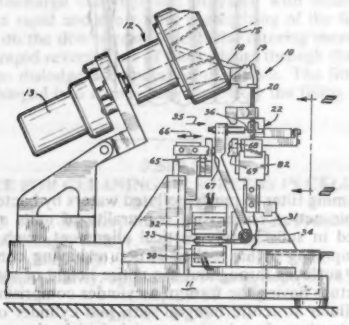
The invention discloses a package for use with frangible objects and a tray which when empty may be readily nested within a like tray and when filled the spaced-apart objects are positioned in holding means formed by a plurality of channels extending transversely to the length of the tray and which channels substantially conform to the contour of the objects. Retaining means is provided on each tray in the form of downwardly extending legs which when the trays are in their nested position the legs of an upper tray extend around the object of a lower stacked tray so that substantial incapsulation of each object is obtained to secure them from movement when transported. Removing means is also provided in the form of a groove extending the length of the tray and forming a depression beneath each object such that the

finger of the person removing the objects from the tray may gently lift each object from its seated position by placing his



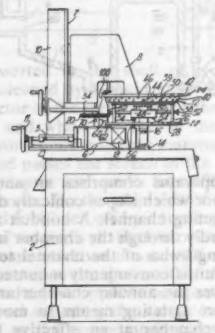
finger within the groove to lift up and grip the respective object.

3,589,512
ARTICLE TESTING DEVICE
Gunteher Schaaf, Fridley, Minn., assignor to Ramsey Engineering Company, St. Paul, Minn.
Filed Apr. 14, 1969, Ser. No. 815,960
Int. Cl. B07c *3/12*
U.S. Cl. 209—73 **11 Claims**



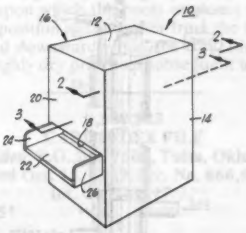
A testing device for magnetic cores for memory systems having a testing station which permits insertion of the testing probe through the opening of a magnetic core or similar object without having the weight of the core resting on the test probe, and which handles the loading, testing and sorting of the cores through electrically actuated solenoids.

3,589,513
APPARATUS FOR SORTING BOTTLES
Eric Heslington Atkinson, Bolton, England, assignor to Barry-Wehmiller Machinery Company Limited
Filed Apr. 21, 1969, Ser. No. 817,751
Claims priority, application Great Britain, Apr. 19, 1968, 18,561/68
Int. Cl. B07c *5/28*
U.S. Cl. 209—75 **23 Claims**



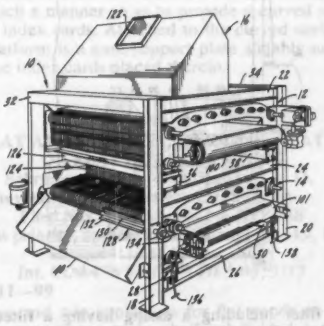
An apparatus for sorting bottles which includes means for advancing bottles to and from an inspection station is described. The bottles are advanced from the inspection station on one of at least two alternative paths in accordance with the condition of an electrically controlled means which, in turn, is controlled by photoelectric devices which sense characteristics of bottles as they pass through an inspection station. Two feeler devices are provided which are shiftable by different portions of a bottle for opening an orifice in a shutter device associated with the photoelectric devices. One photoelectric cell is arranged to sense the presence of a ceramic label. Logic circuits providing AND and OR functions are used for controlling the apparatus.

3,589,514
BILL-VALIDATING APPARATUS
Francis E. Townsend, 1305 N. Hudson, Oklahoma City, Okla.
Filed Mar. 27, 1969, Ser. No. 810,974
Int. Cl. G07d *7/00, 3/02.6*
U.S. Cl. 209—73 **25 Claims**



An apparatus for bill validation wherein the apparatus is enabled upon entry of the paper bill to be examined, whereupon the bill is received and held by a transport for movement past a sensor for detection of predetermined characteristics present on the paper bill. The transport means is controlled to move the bill past the sensor and, simultaneously, additional photoelectric monitoring means disposed along the bill transport path provide additional sensing of the paper bill physical characteristics; failure of a sensor function causes reversal of the bill transport while satisfaction of sensor functions continues transport of the paper bill to an escrow depository.

3,589,515
APPARATUS AND METHOD FOR SORTING
Otto C. Krolopp, Chicago, Ill., and Edward S. Wright, Mt. Lebanon, Pa., assignors to Blaw-Knox Company, Pittsburgh, Pa.
Filed Nov. 29, 1968, Ser. No. 779,829
Int. Cl. B07b *13/04*
U.S. Cl. 209—102 **2 Claims**



A sorting apparatus and method for grading or sizing material such as dry agricultural products or wet comestibles, said apparatus being modular in concept whereby a plurality of units differing only in size of sort can be stacked or cascaded to provide multiple sorts, each modular unit having

a transfer conveyor for receiving unders material located beneath a live bed conveyor, said transfer conveyor conveying the unders in a direction transverse to the direction of flow of the live bed conveyor to a discharge zone physically separated from the live bed conveyor discharge zone.

3,589,516

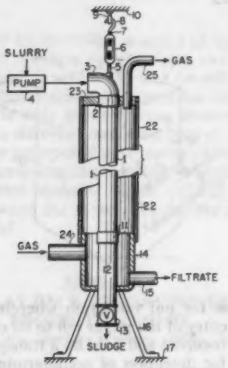
UNIFLOW FILTER WITH GASIFYING MEANS

Wayne M. Camirand, Albany, and Karel Popper, Danville, both of, Calif., assignors to The United States of America as represented by the Secretary of Agriculture

Continuation-in-part of application Ser. No. 766,696, Oct. 11, 1968, now Patent No. 3,523,077, dated Aug. 4, 1970. This application July 6, 1970, Ser. No. 52,161

Int. Cl. B01d *23/04, 29/14, 37/04*

U.S. Cl. 210—70 13 Claims



Apparatus which utilizes a vertically positioned, foraminous, flexible hose as a filter chamber and a surrounding cylindrical shroud of impervious flexible material which serves as a means for exposing the filtrate to a selected gas.

3,589,517

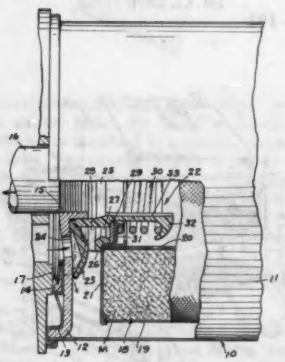
FILTER ELEMENT, RELIEF AND CHECK VALVE, ASSEMBLY

Robert Palmai, Preston, Ontario, Canada, assignor to Sheller-Globe Corporation, Detroit, Mich.

Filed Dec. 4, 1968, Ser. No. 781,135

Int. Cl. B01d *27/10*

U.S. Cl. 210—130 6 Claims



An oil filter including a casing having a filter element therein. The casing has a bottom wall with a centrally located egress opening and a plurality of circumferentially spaced entrance openings surrounding the egress opening. A pressure relief valve is interposed between the lower end of the filter element and the egress opening and a resilient antidrain-back valve is interposed between the back pressure valve and the bottom wall in overlying relationship to the spaced entrance openings.

3,589,518

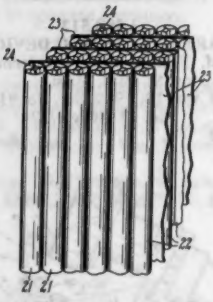
PACKING MATERIALS ESPECIALLY FOR BIOLOGICAL FILTERS

Georges Breblon, Itteville, and Bernard Huriet, La Ferte-Alais, both of, France, assignors to Ircha Institut National De Recherche Chimique Appliquee, Paris, France

Continuation of application Ser. No. 524,612, Feb. 2, 1966. This application Mar. 6, 1969, Ser. No. 813,391

Int. Cl. B01d *35/00*

U.S. Cl. 210—150 7 Claims



A streaming filter to purify polluted waters by bacteriological aerobic action comprising a plurality of units arranged juxtaposed in substantially vertical alignment, each of said units comprising a thin walled structure having continuous exchange surfaces throughout the entire height of said filter, said structure having the form of a cylinder comprising an internal cellular structure integral with said cylinder obtained by the extrusion of a plastic material rigid in the cold state for a length equal to the useful height of said filter.

3,589,519

GRIT SEPARATING APPARATUS

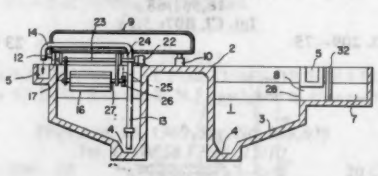
Henry Bendel, 3, rue Gautier, 1201 Geneva, Switzerland, assignor to Passavant-Werke, Michelbach, Hutte, Germany

Filed Jan. 21, 1970, Ser. No. 4,584

Claims priority, application Switzerland, Jan. 29, 1969, 1338/69

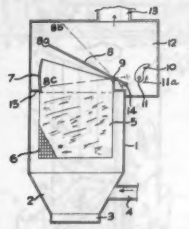
Int. Cl. B01d *21/24*

U.S. Cl. 210—208 10 Claims



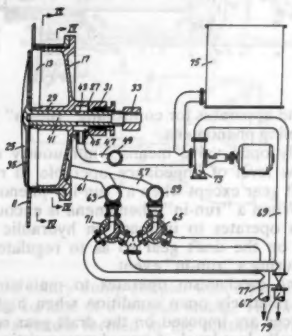
Grit separating apparatus comprises an annular settling chamber having a floor which slopes conically downwards to an annular grit collecting channel. A conduit for removing grit extends downwardly through the chamber into the channel and is moved lengthwise of the channel to remove grit therefrom. The conduit is conveniently mounted on a bridge extending radially over the annular chamber and the bridge may serve to support agitating means to move the water through the setting chamber at an effective flow velocity between a raw water inlet port and a treated water outlet port.

3,589,520
FILTERING APPARATUS
John Thorne, The White House, 4, Church Street, Rothley, Leicestershire, England
Filed Nov. 7, 1968, Ser. No. 773,984
Claims priority, application Great Britain, Nov. 7, 1967, 50658/67
Int. Cl. B01d 46/04
U.S. Cl. 210—333 2 Claims



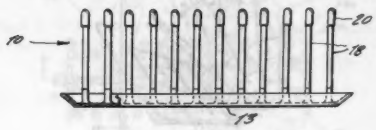
Filtering apparatus having a filtering compartment and an upper discharge chamber and provided with means for effecting a rapid and short term pressurizing of the fluid to be filtered on the downstream side of the filtering means so that a short rapid reverse flow of fluid occurs through the filtering means to dislodge accumulation of filtrate. The filtrate may be discharged into a collecting bin below the filling compartment.

3,589,521
DEVICE FOR CLEANING OF SCREENS IN CELLULOSE DIGESTERS
Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Aktiebolaget Kamyr, Karlstad, Sweden
Filed Sept. 13, 1968, Ser. No. 759,632
Claims priority, application France, Sept. 15, 1967, 12,729/67
Int. Cl. B07b 1/50
U.S. Cl. 210—411 4 Claims



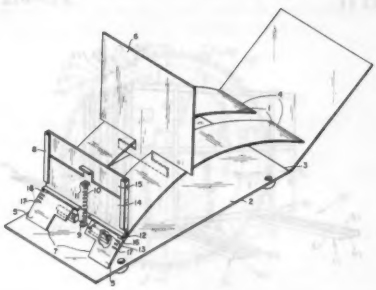
Screens inserted in the shell of a continuous cellulose digester are cleaned by a liquid under high pressure pumped through a sector of the screen during the normal operation of the digester and while the rest of the sd for drawing off digesting liquor from the fibrous material in the digester. The cleaning liquid passes the screen in the opposite direction to the digesting liquor and works loose fibers wedged into the slits of the screen. On the pulp side of the screen the sector being cleaned is blinded off by a turning cover plate, and the space back of screen is divided into sector-shaped compartments. By means of valves a conduit for circulating cleaning liquid is connected to the space within the sealing edge of the cover plate and to the opposite compartment. By turning the cover plate and adjusting the valves one screen sector at a time as well as the corresponding compartment and connected conduits are cleaned and fibers and deposits removed therefrom.

3,589,522
BOOT RACK
Thelma Chiodo, 13 East Bell Street, Des Moines, Iowa
Filed June 26, 1969, Ser. No. 836,767
Int. Cl. A47f 7/08
U.S. Cl. 211—34 3 Claims



A drying rack upon which boots or mittens may be dried, the rack comprising a tray having a plurality of upwardly extending posts upon which the boots or gloves may be draped in an inverted position so that water from the interior thereof may be dripped downwardly into the tray, thus allowing the same to thoroughly dry prior to a subsequent use thereof.

3,589,523
CARD INDEX FILE
Wendell D. Belden, P.O. Box 7606, Tulsa, Okla.
Filed Oct. 15, 1969, Ser. No. 866,696
Int. Cl. B42f 17/12
U.S. Cl. 211—51 4 Claims

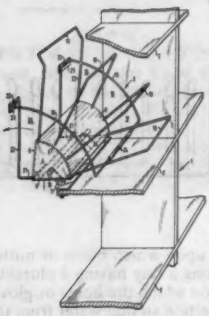


A new and improved card index file useful for quick access to information on the cards filed therein, the card file comprising a dihedral angular baseplate with a split curved platform attached to each of two surfaces of the dihedral angular plate in such a manner so as to provide a curved surface for mounting index cards. Attached to the curved surface of the curved platform is a card-support plate slidably mounted to support the index cards placed therein.

3,589,524
A DISPLAY AND SALE APPLIANCE FOR FLAT GOODS OR FLAT GOOD PACKAGES
Werner Schramm, c/o Dipl.-Ing. A. O. Berglein Widenmayerstr. 491, 8 Munich, 22, Germany
Filed Nov. 1, 1968, Ser. No. 772,748
Claims priority, application Germany, Jan. 19, 1968, P 16 11 750.3
Int. Cl. A47b 88/18; A47f 5/08, 5/12
U.S. Cl. 211—99 1 Claim

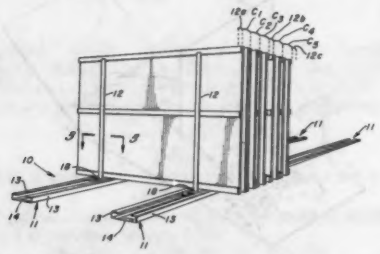
A display and sale appliances for flat goods or flat good packages, comprises a main shelf subdivided in compartments, in which goods carriers are pivotally disposed near the front edges of the compartments over a predetermined angle. Each goods carrier includes a common hollow base body and insertion pockets fanlike disposed around the axis of the pivots of the goods carriers and upon the goods carriers and

having lateral limiting members and intermediate partitions consisting of wires, rods or the like, said limiting members



consisting for all insertion pockets of each goods carrier of one uniform integral wire, rod or the like.

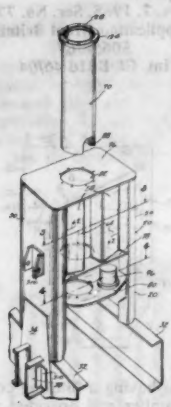
3,589,525
GLASS CASE STORAGE RACK
Byron W. Allen, 188 South I St., San Bernardino, Calif.
Filed Mar. 10, 1969, Ser. No. 805,468
Int. Cl. A47f 5/00; E04b 1/38; F16b 9/02
U.S. Cl. 211—162 **4 Claims**



One or more (preferably two) floor-supported post-mounting stringers, each comprising parallel, conventional structural steel confronting channels, rigidly united by spanner plates welded at their ends to the lower channel webs in abutting relation therewith. Tubular posts have footings on their lower ends which are insertable downwardly between the channels of a stringer and rotatable into locking engagement with the stringer at any desired lengthwise location on the latter. Posts are thus conveniently spaced along each stringer to form rack bins between the posts for holding, on edge, any desirable number of flat cases of heavy material, such as plat glass, and the like.

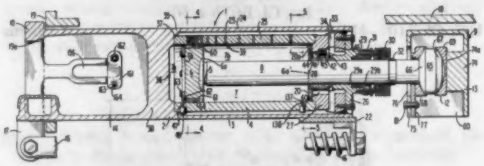
3,589,526
VEHICLE-MOUNTED HOIST
Frank G. Woodside, 1721 E. Fox Lane, Milwaukee, Wis., and Richard F. Uren, Bowling Green, Ohio, said Uren assignor to said Woodside
Division of Ser. No. 643,637, June 5, 1967. Filed Jan. 14, 1969, Ser. No. 798,573
Int. Cl. B66c 5/00
U.S. Cl. 212—1 **2 Claims**

A box frame reinforced by the walls of oil reservoirs has a prefabricated tubular core sleeve on which mast bearings are assembled in inherent alignment. The structure of the main and jib booms is such as to yield high ratio of strength in relation to weight and the tying of the hinge points of the boom and operating cylinder to each other as well as to the mast gives stability. A worm gear connected to the lower end of the mast provides for 360° rotation accommodated by



swiveled hydraulic manifold connections. The stabilizer legs are not only strong per se but brace the hoist frame.

3,589,527
METHOD AND APPARATUS FOR CONTROLLING TRAIN ACTION EVENTS
Orum E. Seay, Duncan, Okla.; Jack G. Stephenson, Duncan, Okla., and Robert E. Abbott, Forth Worth, Tex., assignors to Halliburton Company, Duncan, Okla.
Filed July 15, 1968, Ser. No. 744,947
Int. Cl. B61g 9/16
U.S. Cl. 213—8 **12 Claims**



Method and apparatus for controlling "run-in" train action and car coupling phenomena.

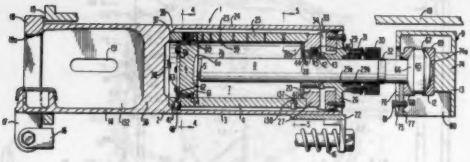
A normally open valve means continuously maintains a relatively low level of impedance operable to resist movement of draft gear except when a "run-in" phenomena is encountered. When a "run-in" phenomena is encountered, the valve means operates to increase an hydraulic impedance level acting on the draft gear so as to regulate draft gear movement during a "run-in" event.

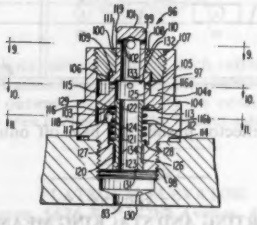
A disabling mechanism operates to maintain the valve means in a relatively open condition when high level buff coupling forces are imposed on the draft gear so as to provide a generally low level of impedance resisting draft gear movement during the application of high energy impact shocks to the draft gear.

3,589,528
VALVE APPARATUS FOR CONTROLLING TRAIN ACTION EVENTS
Jack G. Stephenson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Aug. 14, 1968, Ser. No. 752,649
Int. Cl. B61g 9/16
U.S. Cl. 213—43 **3 Claims**

A valve apparatus for controlling "run-in" train action events. The valve is characterized by a valve member which is normally open to provide a low impedance level in an hydraulic cushioning device capable of effectively absorbing buff coupling shock. Fluid reaction surface means associated with the valve member enables the valve member to move to

a relatively closed position to provide a high impedance level and thus enable the cushioning device to control "run-in" train action events. A disabling device obviates the function





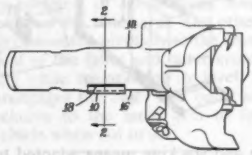
of the reaction surface means, when buff coupling forces act on the cushioning device, so as to cause the valve member to remain open.

3,589,529

ROTARY DUMP COUPLER WITH SHANK WEAR PLATE

Russell G. Altherr, Munster, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 11, 1969, Ser. No. 884,284
Int. Cl. B61g 1/38
U.S. Cl. 213—62 A **7 Claims**



An improved rotary dump coupler with a novel wear plate for the bottom surface of a coupler shank. The wear plate is positioned in a recess formed in the bottom surface of the coupler shank and is rigidly fastened thereto so as to be seated in the recess to equally distribute the coupler weight and to prevent buckling of the wear plate which can result in fracture of the fasteners. The coupler shank side surfaces have formed on the lower portion thereof a radius that terminates substantially tangent to the wearing surface of the wear plate to insure a smooth nongouging operation of the coupler during rotation.

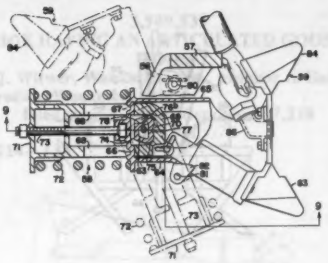
3,589,530

TRAINLINE CONNECTOR APPARATUS

William J. Metzger, East Cleveland, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sept. 19, 1968, Ser. No. 760,912
Int. Cl. B61g 5/08
U.S. Cl. 213—76 **17 Claims**

A trainline connector adapted to be carried by a railway vehicle coupler, having an arm carrying a connector head that is capable of automatically connecting to a mating connector head of a connector on an opposing coupler. The arm can be moved and held in connecting position, can have substantially universal angling movements during travel of the



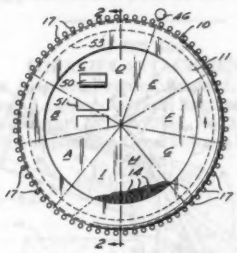
vehicles when the connector is connected, and can be moved to and held in a nonconnecting storage position to permit coupling with a coupler that does not carry such a connector and to permit manual connection of the trainlines.

3,589,531

BALLOON COUNTER

Lawrence J. Povlacs, Dothan, Ala., assignor to Akwell Industries, Incorporated, Dothan, Ala.

Filed Apr. 23, 1969, Ser. No. 818,682
Int. Cl. G06m 7/00
U.S. Cl. 214—1 C **11 Claims**



A method and apparatus for counting articles are disclosed which utilize a cylindrical drum radially divided into several individual sections or counters. Each individual counter includes at least one vacuum manifold extending axially along the outer surface of the drum. Each manifold is provided with at least one nozzle which extends to the inner surface of the drum and which is operable to pick up articles when its associated manifold is vacuum actuated. As one of the counters rotates through a zone in which the articles to be counted lie, some of its manifolds are actuated with a vacuum so that their associated nozzles pick up a preselected number of articles. Continued rotation of the drum rotates the counter to a zone wherein each of the actuated manifolds is supplied with air pressure to release the predetermined number of articles so that they fall on a conveyor belt which carries them to a receptacle. By actuating different combinations of manifolds of each counter, each counter is able to transfer any one of several predetermined numbers of articles.

3,589,532

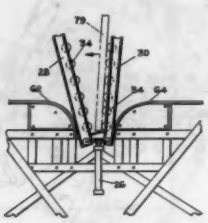
PLANAR ARTICLE INVERTER

Harlan J. Filkins, 7531 Blakely Drive N. E., Rockford, Mich.

Filed June 23, 1969, Ser. No. 835,364
Int. Cl. B65g 47/24
U.S. Cl. 214—1 QA **12 Claims**

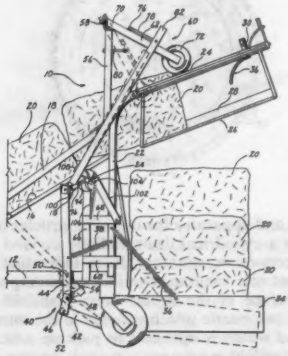
This disclosure relates to an apparatus for inverting planar articles such as tabletops wherein the articles can be suitably

rotated about an edge thereof without damage to the edge. The apparatus contains a pair of platforms in coplanar horizontal relationship and joined therebetween by an abutment which is moved downwardly, thereby rotating the plat-



forms toward the vertical. A planar article, supported by one of the platforms and in contact with the abutment, is raised from a horizontal to a vertical position by the platform and rotated about its edge until it is in contact with and partially supported by the other platform.

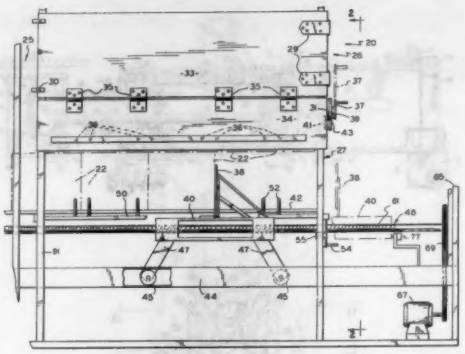
3,589,533
AUTOMATIC TRAY RELEASE ACTUATING MECHANISM FOR BALE STOOKERS
Roy O. Miller, P.O. Box 423, Benkelman, Nebr.
Filed May 14, 1969, Ser. No. 824,484
Int. Cl. B65g *57/32*
U.S. Cl. 214—6 **9 Claims**



This invention relates to an automatic mechanism for tripping the release lever of a bale stooker so as to drop the bale-receiving tray down into its bale-unloading position. The release mechanism includes an arm located in the path of the incoming bales that is raised as each passes therebeneath and functions through a dog-carrying arm pivotally attached thereto to rotate a wheel into position where a trigger turning with the latter trips the bale tray release lever into its discharge position.

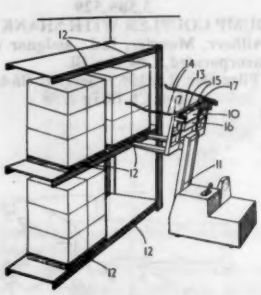
3,589,534
BALE ELEVATOR AND LOADER
Elmer L. Brown, Rte 1, Box 130, Toledo, Wash.
Filed Mar. 20, 1969, Ser. No. 808,751
Int. Cl. B65g *59/06*
U.S. Cl. 214—8.5 A **12 Claims**

A loader having both sides hinged for stacking bales in its hopper has a pusher driven by a reversible screw drive which is stopped when a bale is positioned in a loading position of an elevator. The elevator then lifts the bale and raises it until



an inclined deflector pushes the bale off onto a horizontal conveyor.

3,589,535
TRANSPORTING AND STACKING MEANS WITH A CORRELATED POSITION SENSING AND LOAD SENSING MEANS
Norman George Reading, Stockport, England, assignor to Simon Handling Engineers Limited
Filed Aug. 26, 1969, Ser. No. 853,013
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 **4 Claims**

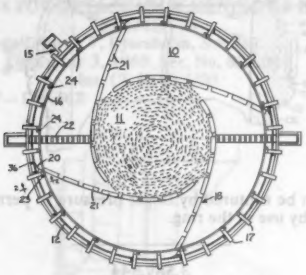


Transporting and stacking means adapted to pick up unit loads such as palletized or crated goods and automatically stack or store them at predetermined positions comprises position sensing means mounted on the transporting and stacking means and arranged to stop position-seeking movement of the transporting and stacking means at a definite position in relation to a fixed point or series of fixed points and a unit load-sensing means comprising mechanical elements which engage the sides of a unit load being supported by the transporting and stacking means through which position sensing means is automatically moved on its mounting to a position related to the unit being transported so that position-seeking movement of the transporting and stacking means will stop at a position related to that of the unit load irrespective of the relative position of the transporting and stacking means.

3,589,536
RETRACTING APPARATUS FOR TRAILING SWEEPS
Winford B. Hickman, Spokane; Gary L. Vanhoff, Veradale, and George H. Pettis, Spokane, all of, Wash., assignors to Atlas Spokane, Inc.
Filed Dec. 8, 1969, Ser. No. 883,194
Int. Cl. B65g *65/42*
U.S. Cl. 214—10 **6 Claims**

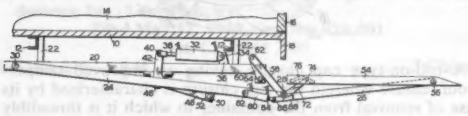
A retracting apparatus for the trailing sweeps of a storage and reclaim system wherein trailing sweep assemblies are

dragged in a predetermined path relative to a pile of material. When movement of the sweep assemblies is to be terminated, vertically movable retractors are first operated in a



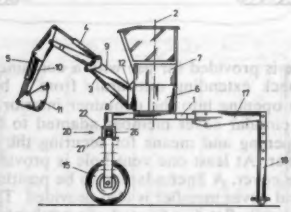
sequence to successively position each retractor in the path of the bucket assemblies. The bucket assemblies are progressively pulled outward of the pile by the continued movement until the pile area is cleared of the bucket assemblies.

3,589,537
PLATFORM ELEVATOR
John F. Petersen, 5626 N. E. 42nd Avenue, Apt. D, Portland, Oreg.
Filed Feb. 4, 1969, Ser. No. 796,417
Int. Cl. B60p *1/44*
U.S. Cl. 214—75 **9 Claims**



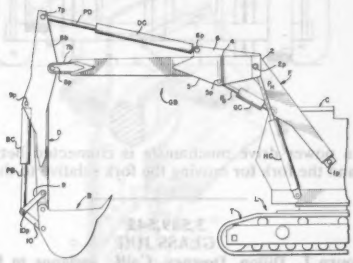
A platform is supported at its outer end on an outer arm connected pivotally to an inner arm which is mounted pivotally on a vehicle-supported frame for vertical movement relative to the latter by a fluid pressure cylinder interengaging the frame and inner arm. The inner end of the platform is supported by one arm of a bell crank lever pivoted intermediate its ends on the inner arm. The other arm of the bell crank lever is connected pivotally to the frame, whereby vertical movement of the inner and outer arms moves the platform vertically while maintaining its level. A fluid pressure cylinder interengages the inner and outer arms to pivot the outer arm relative to the inner arm to fold the platform against the vehicle when not in use.

3,589,538
AXLE ASSEMBLY FOR AN EXCAVATING MACHINE
Ernst Menzi, Widnau, Switzerland, assignor to Ernst Menzi AG., Widnau, Switzerland
Filed June 5, 1969, Ser. No. 830,780
Claims priority, application Austria, June 10, 1968, A5505/68
Int. Cl. E02f *3/75*
U.S. Cl. 214—138 **7 Claims**



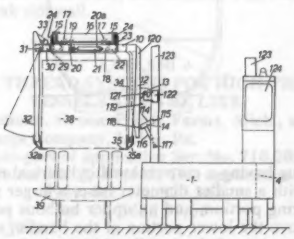
An excavating machine equipped with a shovel at the end of a jib pivotally fastened to a vehicle frame has an approximately U-shaped front axle assembly including a normally horizontal beam projecting far from the frame and carrying vertically adjustable columns on which the front idler wheels may be pivoted in the upright plane of the U-shape. Rear legs of adjustable height are similarly spread far apart to permit the machine to travel on oppositely inclined lateral slopes of a ditch during excavation work.

3,589,539
BACKHOE HAVING AN ARTICULATED GOOSENECK BOOM
Wallace J. Witwer, Waukesha, Wis., assignor to Hein-Werner Corporation, Waukesha, Wis.
Filed June 27, 1969, Ser. No. 837,219
Int. Cl. E02f *3/74*
U.S. Cl. 214—138 **9 Claims**



A backhoe having a boom with an articulated gooseneck, said articulated gooseneck enabling the boom to be retracted and extended to a greater extent than is possible with either a straight boom or a fixed gooseneck boom and, in fact, possessing all of the advantages of each thus achieving a much larger digging profile than is possible with either.

3,589,540
FORKLIFT ATTACHMENTS
John Kinross, Leighton Buzzard, England, assignor to Lancer Boss Limited, Leighton Buzzard, England
Filed Apr. 25, 1969, Ser. No. 819,194
Claims priority, application Great Britain, May 13, 1968, 22629/68
Int. Cl. B66f *9/14*
U.S. Cl. 214—621 **4 Claims**

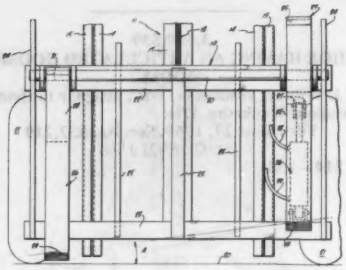


An attachment for use with a power-operated load-lifting attachment of the forklift type, comprising a frame engageable by the forks and having downwardly extending arms movable with respect to this frame to engage the load from below, power-operated means to adjust the frame on the forks and to adjust the arms to engage the load.

3,589,541
LOAD HANDLING IN FORKLIFT TRUCKS
Thomas N. Melin, 1424 24th Ave., Longview, Wash.
Continuation-in-part of application Ser. No. 439,846, Mar. 15, 1965, now Patent No. 3,429,470. This application Feb. 20, 1969, Ser. No. 801,137
Int. Cl. B66f *9/12*
U.S. Cl. 214—731 **4 Claims**

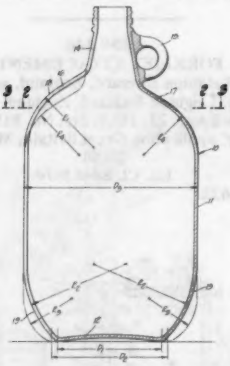
A slope-piling arrangement for a forklift truck in which one of the lifting forks has its vertical leg movably engaged

with the fork apron so that the fork leg, during movement relative to the apron, is constrained to move vertically, and in



which a power drive mechanism is connected between the apron and the fork for moving the fork relative to the apron.

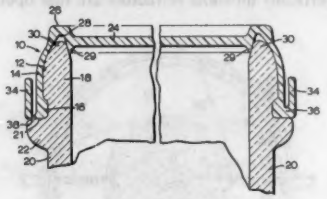
3,589,542
GLASS JUG
Chadbourn L. Dillon, Downey, Calif., assignor to Latchford Glass Company, Los Angeles, Calif.
Filed Feb. 4, 1970, Ser. No. 8,489
Int. Cl. B65d *23/00*
U.S. Cl. 215—1-R **2 Claims**



A glass jug having a conventional cylindrical midportion is provided with a smaller diameter base, a larger radius at the bottom flaring portion, and an upper bulbous portion which extends above the lower portion of the handle, except in the immediate region of the handle. Although the new jug has the same volumetric capacity, it is easier to manufacture because of the large radius adjacent the base. Also it is lighter in weight, although it has the same wall thickness.

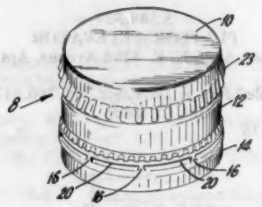
3,589,543
CONTAINER CLOSURE HAVING FRANGIBLE SKIRT PORTION
Bruno Weigand, Scarborough, Ontario, Canada, assignor to Tamper-Proof Tops Industries Ltd., Toronto, Ontario, Canada
Filed June 10, 1968, Ser. No. 735,786
Claims priority, application Canada, Mar. 23, 1968, 15,690
Int. Cl. B65d *41/22, 41/20*
U.S. Cl. 215—42 **8 Claims**

A tamperproof, safety, plastic cap for containers comprising an end wall and cylindrical skirt adapted to tightly fit onto the neck of a container, and a ring slightly larger than the skirt hinged onto said skirt at one point and joined to the skirt at a plurality of other points by bridges such that the



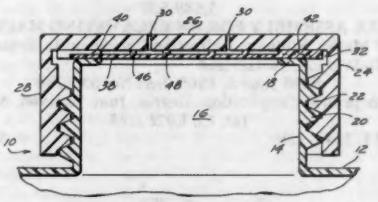
bridges can be ruptured by finger pressure to permit removal of the cap by use of the ring.

3,589,544
TAMPERPROOF CAP CLOSURE
Charles N. Hannon, 27 Sargent Road, Scarsdale, N.Y.
Filed June 26, 1969, Ser. No. 836,838
Int. Cl. B65d *41/20*
U.S. Cl. 215—42 **9 Claims**



A roll-on-type cap closure having an improved tamperproof feature wherein the cap closure is characterized by its ease of removal from the container to which it is threadibly engaged incident to providing the authorized user with excellent tactual, audible, and physical indications of whether the cap closure has or has not been previously subjected to tampering.

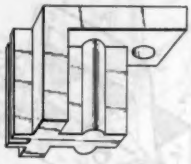
3,589,545
VENTED CLOSURE
Herbert L. Carpenter, Jr., Babylon, and Robert A. Dubois, East Setauket, both of, N.Y., assignors to The Greif Brothers Corporation, Delaware, Ohio
Filed Sept. 19, 1969, Ser. No. 859,527
Int. Cl. B65d *23/00, 51/16*
U.S. Cl. 215—56 **11 Claims**



A closure is provided for use with a container of the type having a neck extending outwardly from a body member defining an opening into the container interior. The closure includes a circular cover member adapted to be positioned over the opening and means for securing the cover to the body member. At least one vent hole is provided extending through the cover. A liner adapted to be positioned between the neck and cover member is also provided. The liner comprises a generally flat disc formed of a resilient material having a bottom surface adapted to seat on top of the container neck and seal the neck opening. The top surface of the liner includes rib means coupled to the disc extending upwardly from the disc top surface. The rib means includes a plurality

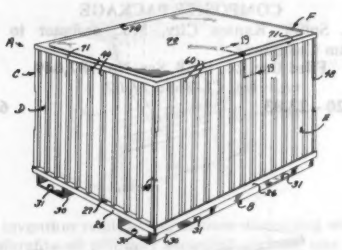
of radially extending ribs spaced outwardly from a segmented circular rib.

3,589,546
MEANS FOR DETACHABLE JOINING OF BEAM ELEMENTS
Paul Wedendal, Aurau 7, Djursholm, Sweden
Filed June 3, 1969, Ser. No. 830,081
Int. Cl. F16b *3/00*
U.S. Cl. 287—189.36R **6 Claims**



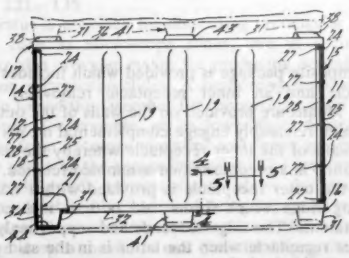
Means for detachably joining two beam elements by a joint which is resistant to bending and torsion forces. The means comprises two engageable parts, one of which has a portion which may be moved into sliding engagement with a mating recess in the other part, with the sliding engagement occurring at right angles to the longitudinal axis of the beam elements which are detachably joined. A screw passes through one of the parts and threadably engages in the other part to prevent separation of the joined parts.

3,589,547
CONTAINER CONSTRUCTION
Brian Hambleton, Palos Verdes, Calif., assignor to Irvin Industries, Inc., Lexington, Ky.
Filed May 22, 1969, Ser. No. 826,801
Int. Cl. B65d *7/00*
U.S. Cl. 220—1.5-R **7 Claims**



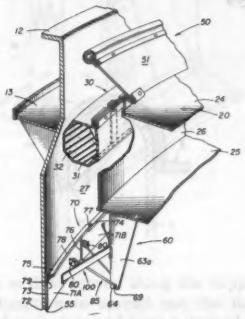
A container having a base, walls and a top, and wherein the walls are removably attachable to the base and to each other, providing a reusable knockdown container, the top being removably received by the walls.

3,589,548
KNOCKDOWN CONTAINER
Lyle R. Weiss, 42 N. Main, Clarkston, Mich.
Filed May 12, 1969, Ser. No. 823,869
Int. Cl. B65d *7/34, 11/18*
U.S. Cl. 220—4 R **9 Claims**



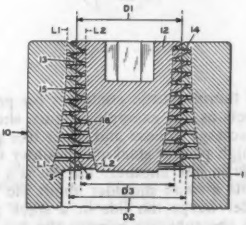
A knockdown-type shipping container for shipping articles. The container has sides with interengaging corner posts and which are held together by means of a top and bottom at least one of which has recesses to supportingly contain corner posts of the sides.

3,589,549
SCRAPER STRUCTURE FOR STORAGE TANKS
Milton Walter Heisterberg, Homewood, Ill., assignor to General American Transporation Corporation, Chicago, Ill.
Filed Dec. 19, 1968, Ser. No. 785,110
Int. Cl. B65d *87/18*
U.S. Cl. 220—26 **19 Claims**



There is disclosed a scraper structure for petroleum storage tanks of the type having an upstanding cylindrical sidewall with an outer surface and an inner surface, a floating roof having a substantially cylindrical wall spaced inwardly from the inner surface of the tank sidewall thereby defining an annular space therebetween, and sealing means arranged in and sealing the annular space, the scraper structure being mounted on the cylindrical wall of the floating roof and spaced below the sealing means. The scraper structure includes a plurality of elongated plates arranged around and disposed against the inner surface of the tank sidewall, the adjacent ends of the adjacent plates overlapping, each of the plates having a lower edge in scraping contact with the inner surface of the tank sidewall, and including means for mounting the plates on the floating roof and means for yieldingly urging the plates toward and into contact with the inner surface of the tank sidewall.

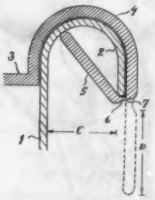
3,589,550
FLEXIBLE THREAD SYSTEMS FOR HIGH-PRESSURE VESSELS AND THE LIKE
Peter F. Rossmann, Grosse Pointe Farms, Mich., assignor to National Forge Company, Irvine, Pa.
Continuation-in-part of application Ser. No. 710,205, Mar. 4, 1968, now Patent No. 3,487,442. This application Nov. 17, 1969, Ser. No. 877,307
Int. Cl. B65d *39/08*
U.S. Cl. 220—39 R **5 Claims**



A flexible thread system for use on screw-type closure structures for high-pressure vessels and the like wherein a

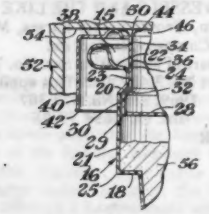
gullet, with a paraboliclike taper, is provided below the normal root portion of one, or both, of the mating male and female threads of the screw-type closure, the gullet or gullets enabling the thread cross section to deflect as a lever in order to enable the closure threads to be uniformly stressed and to accommodate the pressurized stress patterns of the vessel system.

3,589,551
LOCKING DEVICE FOR COVER OF CONTAINERS
Rolf Haggbom, Idunvagen 14, 13303 Saltsjobaden, Sweden
Filed May 6, 1969, Ser. No. 822,209
Claims priority, application Norway, May 16, 1968, 1941/68
Int. Cl. A47j *27/08;* **B65d** *45/00*
U.S. Cl. 220—59 **6 Claims**



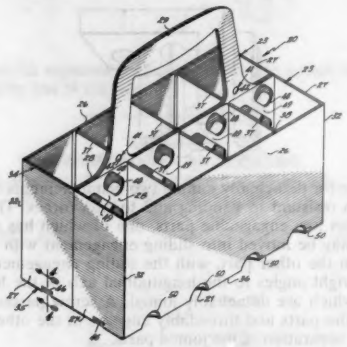
Locking device for cover of containers with an elastic rim running around the opening, which device consists of elastic flaps which can be bent round and pressed into the space between the inside of the rim and the container wall into locked position with said wall.

3,589,552
CONTAINER
Charles E. Fitzgerald, and Robert J. McCormick, both of Findlay, Ohio, assignors to The Dow Chemical Company, Midland, Mich.
Filed May 23, 1969, Ser. No. 827,219
Int. Cl. B65d *43/10, 21/00*
U.S. Cl. 220—60 **6 Claims**



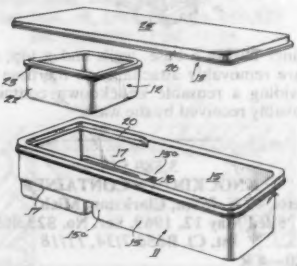
A thin walled thermoplastic container for packaging food and dairy products as, for example, yogurt, sherbets and ice creams, salads, cottage cheese and other like products. The tub includes a high profile stacking shoulder which renders like tubs nestable in one another. The lid is a novel snap-in lid which presents a small shoulder about the top of the lid rim. The shoulder keeps the lids in a stack prior to their being utilized to cap tubs but permits the lids to be readily disengaged from one another by automatic coin feeding and to be readily separable from a capping device in a capping operation.

3,589,553
MOLDED PLASTIC CONTAINER
Robert Culver, Rossburg, and Charles W. Ridge, Middletown, both of, Ohio, assignors to Culver Industries, Inc., Ansenia, Ohio
Filed Apr. 17, 1969, Ser. No. 816,907
Int. Cl. B65d *5/46, 5/48*
U.S. Cl. 220—111 **10 Claims**



A one-piece molded plastic container as a carrying case or carton for bottles and the like having a collapsible construction which permits the container to be readily collapsed into a number of forms for shipment, storage, cleaning and reuse.

3,589,554
COMPOSITE PACKAGE
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company
Filed Dec. 26, 1968, Ser. No. 787,049
Int. Cl. B65d *21/02*
U.S. Cl. 220—23.83 **6 Claims**



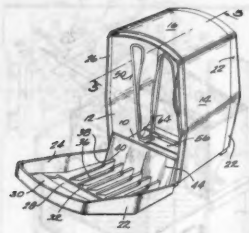
A composite package is provided which includes an outer receptacle and an inner receptacle removably mounted therein. Means are provided on the walls of the outer receptacle which releasably engage complemental means provided on the walls of the inner receptacle whereby the receptacles are retained in a predetermined assembled relation. The bottom of the outer receptacle is provided with a transversely extending ridge which forms said bottom into contiguous compartments. The ridge subtends and supportingly engages the inner receptacle when the latter is in the said predetermined assembled relation.

3,589,555

DISPENSER FOR PAPER NAPKINS AND THE LIKE

Robert Burkhalter, Jr., Fort Atkinson, Wis., assignor to Alwin Manufacturing Company, Inc., Green Bay, Wis.

Filed Jan. 27, 1969, Ser. No. 794,318
Int. Cl. B65h *1/12*
U.S. Cl. 221—35 12 Claims



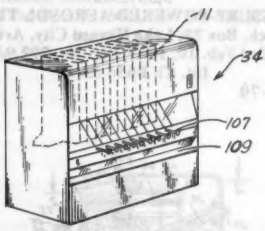
An open-ended case has pivoted doors with dispensing openings marginally formed to cooperate with pusher means to afford varying resistance as successive articles are dispensed. Pusher plates are eliminated by the form of the follower springs themselves. Pressure of pusher springs is relieved during loading by pivoting the springs to the case and providing a flange on each door which holds its spring in operative position only when the door is shut.

3,589,556

ARTICLE DISPENSING MODULE

Francis A. Wittern, 1616 Cassidy, Des Moines, Iowa

Filed May 29, 1969, Ser. No. 829,076
Int. Cl. G07f *11/06*, *11/48*
U.S. Cl. 221—90 12 Claims



This invention relates to an article dispensing module having a plurality of pivotally mounted shelves, one above the other, and means for latching the shelves in an article storing position. A nugger bar having trip fingers rotatably mounted thereon is positioned to release said shelves, one at a time, to an article dispensing position in ascending order in response to an operating means.

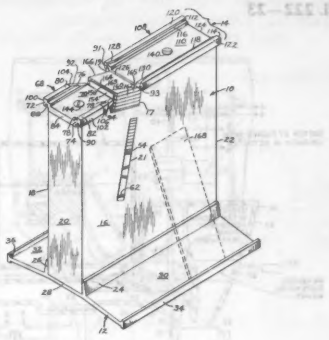
3,589,557

SLIDE DISPENSER

Leighton Clifford Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 3, 1969, Ser. No. 813,063
Int. Cl. A24f *27/14*
U.S. Cl. 221—135 7 Claims

Apparatus is provided for dispensing rectangular platelike objects, such as microscope slides, one at a time. This dispenser also provides means for producing desirable liquid smears on microscope slides. A supporting track is located along the top of the dispenser for supporting a slide having a blood drop, for example, on its lower face. A stored slide protrudes from a storage magazine and forms an acute angle with the plane of the supporting track. The leading edge of the protruding slide projects slightly above the plane of the supporting tract and is capable of being depressed so as to be in the same plane as the supporting tract. The slide having the blood drop is moved in one direction along the track in depressing engagement with the leading edge of the protruding slide until the blood drop on its under side contacts said protruding slide and forms a liquid capillary meniscus in the acute angular space between the two slides. The slide having the blood drop is then moved along the supporting track in the opposite direction to spread out the liquid along the lower surface of such slide and form a desired liquid smear.

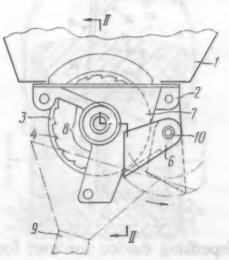


3,589,558

SOWING APPARATUS FOR DRILLS

Evgeny Alexandrovich Belyaev, Unchinskaya ulitsa, 3, kv. 50, Moscow; Leonid Efinovich Katsnelson, 16, Parkovaya ulitsa, 49, Korpus 2, kv. 17, Moscow; Alexei Alexeevich Terekhin, ulitsa Mikhailova, 30, kv. 8, Moscow; Sergei Petrovich Volkov, Sretensky bulvar, 6/1. kv, 161, Moscow; Leonid Nikolaevich Filipiev, Obryvnoi pereulok, 11, Kirovograd; Anatoly Vladimirovich Bozhor, ulitsa Vorovskago, 91, Kirovograd; Mikhail Pavlovich Odegnalov, ulitsa Frunze, 14, kv. 36, Kirovograd, and Nikolai Ignatievich Ljubushko, ulitsa Oktyabrskaya, 27, kv. 18, Dolgoprudny, all of, U.S.S.R.

Filed Mar. 7, 1969, Ser. No. 805,184
Int. Cl. B65g *59/12*; B65h *3/00*
U.S. Cl. 221—266 5 Claims



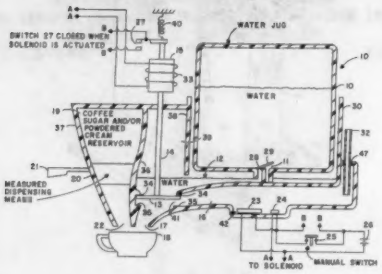
A sowing apparatus for drills, in which the working member is fashioned as a ring with inner ribs and is disposed in the body made so that it is possible to relieve the apparatus and the seed hopper of the seeds. To effect this, at least one of the body walls enveloping the ring from the side face is made composite, and at least one of the component parts of the wall is made movable.

3,589,559

HOT DRINK DISPENSER

Eldon L. Colton, 366 Brentwood Drive N.E., Cedar Rapids, Iowa, and Russell F. Colton, 857 16th St. S.E., Cedar Rapids, Iowa

Filed Dec. 4, 1968, Ser. No. 781,006
Int. Cl. B67d *5/38*
U.S. Cl. 222—23 **18 Claims**



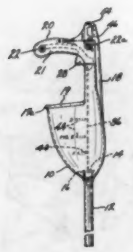
A hot beverage dispensing means having first, second, and third reservoirs; one below the other in the order listed. The first reservoir is watertight except for one outlet at the bottom thereof which fills the second reservoir up to the level of said opening. A two-position valve in its lower position allows water to flow from the second to third reservoir where it is heated by a heater activated when said valve is in its lower position. Movement of the valve to its upper position in response to a thermostatic indication deactivates the heater and release the heated water into a cup.

3,589,560

MATERIAL DISPENSING MECHANISM

Fred A. Wilcox, 4719 W. 210th, Fairview Park, Ohio

Filed Mar. 19, 1969, Ser. No. 808,544
Int. Cl. B67d *5/22*
U.S. Cl. 222—31 **14 Claims**



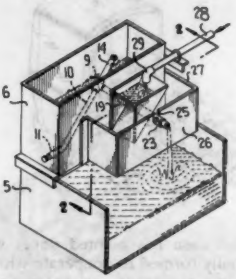
A material dispensing device for use, for instance, as a multipurpose garden gun, comprising a storage section adapted for receiving a quantity of material therein, such as for instance fertilizers (either liquid or solid), weed killers, (either liquid or solid) lime or the like, with a dispensing tube communicating with and extending from the storage section, and with valve means coacting with the storage section and the dispensing tube for controlling the discharge of the material from the storage section into the tube. A pistol-grip-type handle is provided, with trigger means coupled to the valve means for selective and expeditious actuation of the valve means.

3,589,561

APPARATUS FOR MEASURING AND DISPENSING LIQUIDS

Harry Gilbert Davis, P.O. Box 18, Combes, Tex.

Filed Sept. 22, 1969, Ser. No. 859,674
Int. Cl. B67d *5/08*
U.S. Cl. 222—57 **2 Claims**



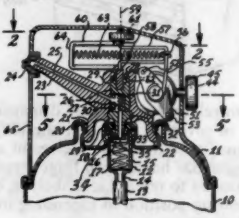
Apparatus for measuring and dispensing a liquid chemical into a water reservoir including a dipper pipe and measuring pipe connected together in alignment, means for alternately raising and lowering the dipper and measuring pipes in a chemical supply tank so that upon raising the dipper pipe a supply of chemical will be raised by the dipper pipe and dispensing into the measuring pipe, the dipper pipe having means at its inner end extending into the measuring pipe for directing the flow of chemical from the measuring pipe to a discharge pipe when the measuring pipe is raised.

3,589,562

PRESSURE-POWERED AEROSOL TIMER

Willard E. Buck, Box 71, Lake Havasu City, Ariz.

Filed Feb. 10, 1969, Ser. No. 797,940
Int. Cl. B65d *83/14*
U.S. Cl. 222—70 **3 Claims**



A pressure-powered variable timer for aerosol spray cans for automatically operating the can to periodically spray its contents at desired predetermined intervals, the pressure within the can being utilized to actuate the timer.

3,589,563

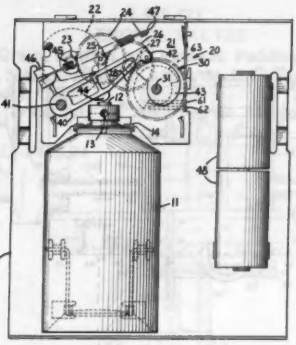
LONG PERIOD BATTERY-OPERATED AEROSOL DISPENSER

John F. Carragan, Woodbury, and Sebastian A. Vecca, Waterbury, both of, Conn., assignors to General Time Corporation, Stamford, Conn.

Filed Aug. 11, 1969, Ser. No. 848,982
Int. Cl. B67d *5/08;* **G04c** *23/38*
U.S. Cl. 222—70 **11 Claims**

An automatic aerosol dispenser for producing periodic discharge from an aerosol container at long, accurately determined time intervals on the order of 15 minutes or more and which is completely self-contained, operating on low battery voltage on the order of 3 volts. The time interval is determined by an RC circuit having a long-time constant,

with a transistor detector-amplifier, including feedback, for initiating a cycle of motor rotation. The capacitor of the RC circuit is restored to reference condition in an RC circuit of



short-time constant. An electromechanical driving arrangement is disclosed which is particularly suited for low-voltage operation.

3,589,564

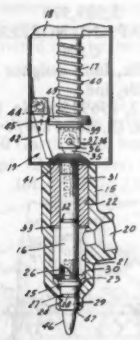
DISPENSING VALVE

Paul Keller, Coon Rapids, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Dec. 9, 1968, Ser. No. 782,073

Int. Cl. B67d *5/5*

U.S. Cl. 222—129.1 **18 Claims**



A dispensing valve includes a valve body within which is disposed a valve which is reciprocated by an actuator acting through a lost-motion connection. Locking means hold the valve in a closed position to prevent unauthorized opening thereof, and the actuator disables or unlocks the locking means before reciprocating the valve. The valve has a tip contoured to combine a tubular flow of liquid into a solid stream and to clear the outlet of any remaining liquid and to throw off such liquid from the tip by inertia. A flavoring passage extends through the body and through the valve to an outlet in the tip. Further, a number of such valve bodies are combined to receive liquid from a single source.

3,589,565

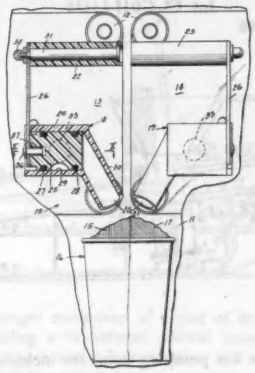
DOUBLE-FLAVOR DRINK DISPENSER

Richard T. Cornelius, Minneapolis, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Dec. 9, 1968, Ser. No. 782,119

Int. Cl. B67d *5/56*; **F16k** *5/00*

U.S. Cl. 222—129.1 **3 Claims**



A double-flavor drink dispenser includes two adjacent valve assemblies having adjacent outlets and adjacent concentric handle grips for simultaneous actuation by one hand or for individual actuation. Each valve assembly includes a valve core concentric with the valve core of the other valve assembly through which the product discharges axially. Each valve assembly can be manually disassembled for cleaning without use of tools.

3,589,566

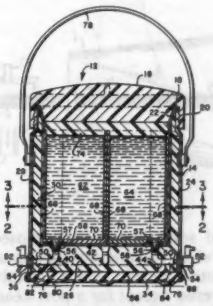
INSULATED CONTAINER

Daniel James Rivest, 1705 Highland Ave., Manhattan Beach, Calif., and Paul Malot Evans, 2105 Reynolds St., Falls Church, Va.

Filed Apr. 29, 1969, Ser. No. 820,132

Int. Cl. B67d *5/60*, *5/64*

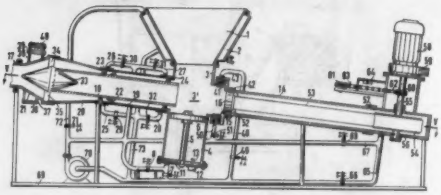
U.S. Cl. 222—132 **8 Claims**



An insulated container which includes a main chamber and a plurality of separate compartment elements to be received in the chamber and each being adapted to receive a separate fluid to be maintained at a relatively stable temperature condition for a prolonged period of time. The container includes a plurality of passageways in the bottom with a mouth opening into the chamber and an exit port provided with spigot and valve means to control fluid flow from within the chamber. Each of the compartment elements includes a

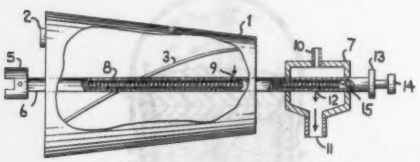
spout sized to be received within the mouth opening of the passageways.

3,589,567
METHOD AND APPARATUS FOR CONVEYING MATERIALS
Bechtold Freiherr Von Und Zu Massenbach, CH-8777 Diesbach/GL, Chalet Ahorn, Switzerland
Filed Jan. 21, 1969, Ser. No. 799,146
Int. Cl. G01f *11/36*
U.S. Cl. 222—146 **15 Claims**



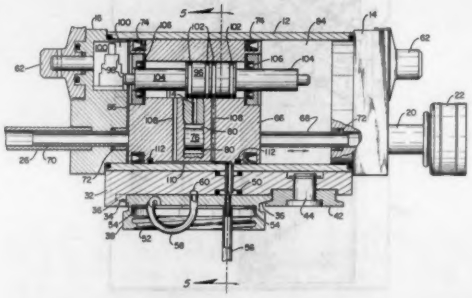
An apparatus for pumping concrete including a working chamber, a hopper connected to the top of the chamber, an intermediate container connected to the bottom of the chamber and including a piston for drawing the material from the hopper into the chamber, a pump cylinder connected to the chamber including a piston for drawing material from the chamber into the cylinder and for pumping the material to the discharge pipe, and a sleeve mounted for axial movement through the chamber to connect the pump cylinder to the discharge pipe. A vibrator is provided on the casing of the discharge pipe and a clamping ring is provided at the entry to the pump cylinder to engage the sleeve when it has been in operative engagement with the pump cylinder.

3,589,568
ROTATABLE HOLLOW SHAFT, HELIX, AND DRUM FOR FEEDING SOLIDS
Charles H. Hoelscher, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Apr. 17, 1969, Ser. No. 817,051
Int. Cl. B67d *5/64*; B67b *7/00*
U.S. Cl. 222—167 **9 Claims**



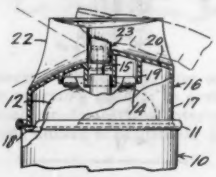
A finely divided solids feeder is disclosed comprising a chamber having a shaft running through an airtight chamber to a feed bin located outside of the chamber. The hollow shaft, which is covered except for a port near the exit end of the chamber, has a helix running through it; the helix going completely through the hollow shaft of the chamber and into a feed bin located outside of the chamber. The shaft is provided with a second opening in the feed bin so that material can be discharged into the feed bin. The chamber and feed bin are provided with airtight seals and provision is made in the feed bin to introduce inert gas to thereby prevent any possible chemical reaction of materials being fed. The chamber, helix and hollow shaft rotate in the same direction. Rotation of the hollow shaft and tension on the helix permit metered feed.

3,589,569
APPARATUS FOR MIXING LIQUID CONCENTRATE WITH A DILUENT
Ralph A. Bonetti, 5970 S. Gaylord Way, Littleton, Colo.
Filed Sept. 25, 1969, Ser. No. 860,994
Int. Cl. G01f *11/06*
U.S. Cl. 222—250 **12 Claims**



Apparatus for mixing a liquid concentrate, such as a pesticide, fertilizer or the like, with a diluent, such as water under pressure, operated by the diluent pressure and which provides a constant volumetric mixing ratio irrespective of variations in diluent rate of flow or pressure thereof. It is further characterized by a reciprocating floating piston having equal and constant displacements at its opposite ends which receive and discharge liquid diluent and to which is added a metered volume of the concentrate by a reciprocating metering spool valve carried by the piston which serves as a pump, the stroke of which may be adjusted to vary the volume of the added concentrate. The stroke of the pump may also be adjusted to a position in which only diluent may be admitted for flushing concentrate from the apparatus to thereby prevent corrosion of the various internal parts of the apparatus upon completion of its use.

3,589,570
ORIENTED OVERCAP AND NOZZLE FOR AEROSOL CAN
Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.
Filed June 2, 1969, Ser. No. 829,557
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.13 **3 Claims**



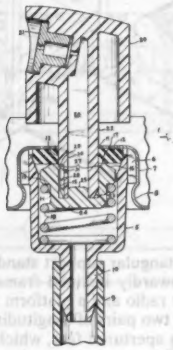
An overcap and nozzle for an aerosol can or the like. The overcap has a finger depression in its top extending part way across and intersecting a nozzle opening also formed in the cap and through which the top of the nozzle protrudes. A user lays his finger in the recession and presses on the nozzle to release the spray out of a lateral orifice in the nozzle. The cap and nozzle have cooperating means which ensure their relative orientation with the orifice pointed away from the user. The cooperating means consist of a key and a keyway formed in the adjacent surfaces of the nozzle and the nozzle opening in the overcap. A ledge lying in a plane that is inclined to the axis of the nozzle is also formed on the surface having the keyway and engageably by the key so as to

produce relative rotation of the nozzle and overcap as they are telescoped together longitudinally by insertion of the nozzle into the nozzle opening, thus ensuring entry of the key into the keyway without the necessity for careful manual or visual inspection by an operator.

3,589,571
AEROSOL VALVES

Derek B. Green, Bedford, and Philip H. Puddington, Amherst, both of, N.H., assignors to Scovill Manufacturing Company, Waterbury, Conn.

Filed July 18, 1969, Ser. No. 842,860
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.24 **2 Claims**

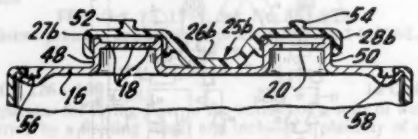


An improved aerosol valve has a removable spray head and stem which telescopes into a valve member and has a groove which extends from the bottom of the stem into communication with an annular flow channel between the valve and stem. The groove results in a thin wall portion through which extends a metering aperture located a substantial distance above the bottom of the stem. The flow channel and groove allow unrestricted flow to the metering aperture.

3,589,572
DISPENSING CONTAINER WITH CLOSURES

Charles Hannon, 250 Garth Road, Scarsdale, N.Y.

Filed Sept. 13, 1968, Ser. No. 759,678
Int. Cl. B67d *3/00*
U.S. Cl. 222—480 **2 Claims**

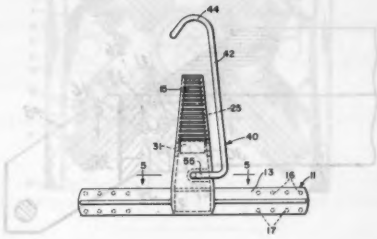


A dispensing container for condiments such as salt, pepper and the like, having a detachable cover. The cover is formed for a forced fit over two separated portions in a wall of the container, one portion carrying an array of shaker holes and the other portion provided with a spoon size hole. The cover is provided with a flexible link or hinge connecting two flaps each of which covers one of the apertured portions. The cover is arranged so that either of the apertured portions can be uncovered while the other apertured portion remains covered.

3,589,573
PANTS HANGER

Steward S. Battles, Box 907, Galesburg, Ill., and Oscar N. Brown, 601 Third Ave., Moline, Ill.

Filed Feb. 3, 1970, Ser. No. 8,190
Int. Cl. A47j *51/14*
U.S. Cl. 223—96 **11 Claims**

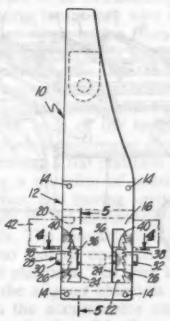


A pants hanger composed of a pair of inverted T-shaped members having a horizontal pivotal connection midway between the upper and lower portions and a single resilient wire element that extends from a common upper hook portion, a pair of shank portions positioned alongside the stem portions of the T-shaped members, and inwardly projecting lower end portions that engage the T-shaped members beneath the horizontal pivotal connection, the wire element being under stress to bias the lower horizontal bar portions toward one another.

3,589,574
ADJUSTABLE BELT LOOP ASSEMBLY FOR PISTOL HOLSTERS AND THE LIKE

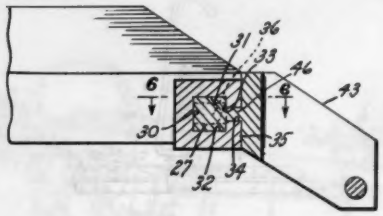
Fred R. Marburger, 1529 19th St. N.W., Canton, Ohio

Filed June 30, 1969, Ser. No. 837,698
Int. Cl. F41c *33/00*
U.S. Cl. 224—2 B **9 Claims**



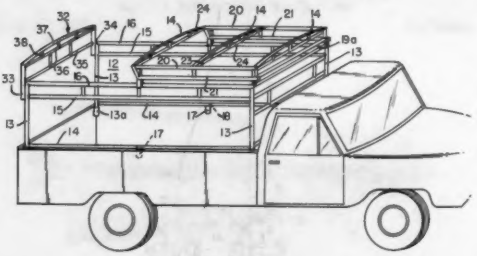
A main body is adapted for operable connection supporting a pistol holster and has a longitudinal belt slot with an adjustment bar extending longitudinally within the slot. The adjustment bar is formed by longitudinally telescoped parts spring pressed longitudinally outwardly and each having a block formed thereon projecting forwardly and rearwardly into vertical adjustment slots of the main body. Normally longitudinally outwardly interengaged teeth are formed between the adjustment bar blocks and sides of the main body adjustment slots, which teeth may be disengaged for adjustment bar vertical bar movement upon oppositely longitudinally inward movement of the adjustment bar parts.

3,589,575
SELECTIVELY INTERCONNECTABLE WATCHCASE AND STRAP CONSTRUCTION
Melvin Axler, 166-25 Powell Cove Blvd., Beechhurst, N.Y.
Filed Aug. 15, 1969, Ser. No. 850,392
Int. Cl. A44c 5/00
U.S. Cl. 224—4 E 1 Claim



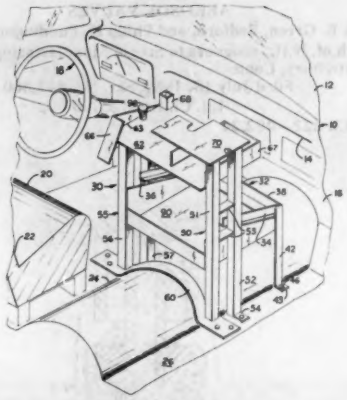
An improved watchcase construction in which the wrist strap is carried by a strap-retaining element slidably engageable with an end wall of the case bezel. The bezel includes channel-forming means in a rectilinear wall thereof, and the strap-retaining element includes an elongated channel-engaging member interconnected by a web portion to the remaining parts of the element. Detent means is provided to maintain the two elements in fully assembled condition, as is stop means for determining said position.

3,589,576
CONVERTIBLE RACK FOR VEHICLE
James L. Rinkle, 2104 North Mueller, Bethany, Okla., and Sonnie D. Stapleton, P. O. Box 94181, Del City, Okla.
Filed Nov. 4, 1969, Ser. No. 873,919
Int. Cl. B60r 9/00
U.S. Cl. 224—42.01 8 Claims



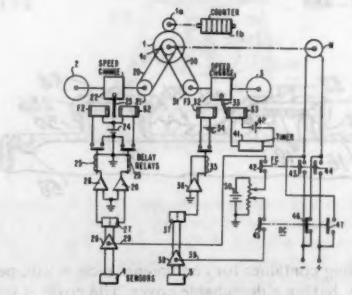
A supporting rack adapted to be secured to the load-carrying portion of a truck body. A pivotally attached portion is adapted to overlie the main portion of the rack, and in such position is provided with a configuration for supporting a tarpaulin or the like. The pivotally secured portion is also adapted to be rotated to a nonoverlying position in which such portion provides an extension of the top framework of the rack so as to provide an elongated support for carrying lengthy loads. A tailgate portion of the rack is also adapted to be secured to the main framework in either of two positions which are the inverse of each other. In one position of the tailgate portion an additional support for the tarpaulin is provided, whereas in the inverted position, an additional extended support is provided for long loads.

3,589,577
ARTICLE CARRYING STAND FOR A MOTOR VEHICLE
Horace B. Basinger, 116 Mambrino Road, Oregon, Ohio
Filed May 22, 1969, Ser. No. 826,921
Int. Cl. B60r 7/04
U.S. Cl. 224—42.42 9 Claims



A generally rectangular support stand for a taxicab having a forwardly downwardly inclined frame or rack adapted to receive a two-way radio and a platform for a fare meter, supported by at least two pairs of longitudinally spaced floor-engaging legs having apertured feet, which pairs of legs may be adapted by a saddle to span a tunnel or hump in the floor of the front seat of the taxicab. These legs also support various other platforms, brackets, compartments, and trays on the stand for sundry articles and a light for use by a taxicab driver.

3,589,578
TENSION-RELIEVING DEVICE FOR STRETCHABLE SHEET MATERIAL
Erich Kamphausen, Rheydt, Germany, assignor to A. Monforts, Monchengladbach, Germany
Filed Jan. 21, 1969, Ser. No. 792,254
Claims priority, application Germany, Jan. 20, 1968, P 16 38 082.8
Int. Cl. B65h 23/20
U.S. Cl. 226—40 8 Claims



In apparatus for advancing a knitted fabric or other stretchable web material, preferably toward a length-measuring device, a feed roller is drivingly engageable with the material and there are material guide means so arranged as to cause the travelling material to form a shallow sagging portion. The feed roller is driven by speed-controllable drive

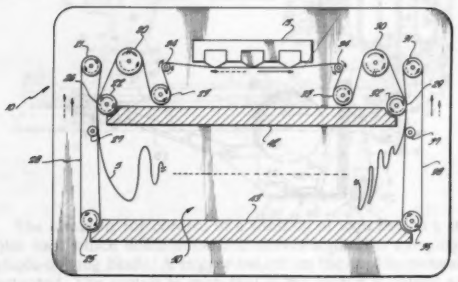
means whose speed control is subject to response of a proximity sensor disposed near to but out of contact with the sagging portion of material and responsive to at least one of given lower and upper limits of sag respectively. The speed control operates intermittently to vary the speed of the feed roller between leading and lagging speed magnitudes for substantially tension-free advance of the material.

3,589,579

BIDIRECTIONAL RANDOM BIN TAPE DRIVE SYSTEM

Gordon Richard Schulz, Tujunga, Calif., assignor to Leach Corporation, Pasadena, Calif.

Filed May 8, 1969, Ser. No. 823,073
Int. Cl. G11b *23/06*
U.S. Cl. 226—50 9 Claims



A drive system for bidirectionally driving a tape of an endless loop random bin tape system is disclosed. The tape is driven across a transducer assembly by a pair of differential capstans. The storage bin has a pair of entrance and/or exit passages communicating with the transducer portion of the recording and reproducing system. At each entrance and/or exit location there is provided an endless belt drive puck pair which makes frictional contact with the magnetic tape. The endless belt drive puck pair always move in the direction tending to urge the tape into the bin irrespective of the actual direction of tape movement. Each pair provides the necessary tape-driving force to drive the tape into the bin in one direction and conversely they will, when the tape moves in an opposite direction, tend to reject spurious loops which are drawn to the bin exit passage.

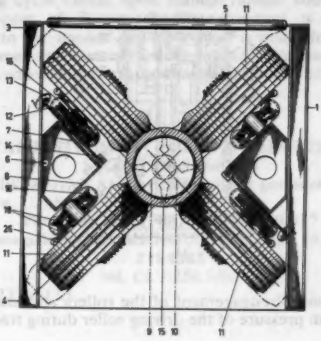
3,589,580

APPARATUS FOR LAYING PIPE ON THE BOTTOM OF A BODY OF WATER

August Hendrik Maria Smulders, Wassenaar, Netherlands, assignor to N.V. Industrieele, Handelscombinatie, Netherlands

Filed Oct. 13, 1969, Ser. No. 865,639
Claims priority, application Netherlands, Oct. 14, 1968, 68.146 78
Int. Cl. B65h *17/22*
U.S. Cl. 226—108 16 Claims

Apparatus for laying pipe on the bottom of a body of water is carried by a floating vessel and includes a plurality of opposed pairs of tires mounted for rotation on and relative to axles which in turn are rotatable relative to their bases. Selectively applicable brakes interconnect the axles and tires, and hydraulic means are provided for rotating the tires stepwise to raise the pipe. During the dwell between steps, a hydraulic motor pressurizes a hydraulic accumulator; and during the step, the accumulator rotates the axle with the brake means applied. The apparatus also serves as a brake for lowering the pipe, during which time the accumulator opposes rotation of the tire when the pipe drives the tire; and to limit the action of the accumulator, the brake is at least partially released after a predetermined rotation of the axle. When the brake is released, the accumulator tends to rotate the axle in the opposite direction; but the brake is self-applying, so that equilibrium is established between the action of



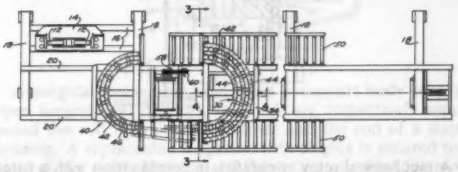
the brake and the action of the accumulator thereby to apply a substantially constant braking torque.

3,589,581

ACCUMULATOR

Donald A. Swindells, Barrington, R.I., assignor to The Entwistle Company

Filed Oct. 22, 1969, Ser. No. 868,474
Int. Cl. B65h *17/42*
U.S. Cl. 226—119 4 Claims



An accumulator used in an extrusion system or other wire line system that requires temporary wire storage when one is paying into the line or when taking from the line as, for example when changing takeup reels to thereby allow the extruder to operate continuously. The structure consists of a fixed flat platform having horizontal rollers placed thereon in a plurality of semicircular paths and having vertical roller guides placed on both ends of the longitudinal axis of the horizontal rollers to form semicircular channels. There is also a movable carriage having a flat platform with horizontal rollers thereon forming a plurality of semicircular paths, one nested within the other, and having vertical guide rollers on each side of the ends of the horizontal rollers to form the semicircular channels. The movable carriage is mounted on rails and is aligned so that its open channels face the open channels of the fixed platform. The wire is wound in a circulating path through the aligned channels and the amount of wire to be stored in the accumulator can be varied as the movable carriage is run back and forth on the rails.

3,589,582

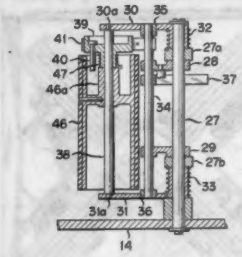
SENSITIVE MATTER-TRACKING DEVIATION-CORRECTING DEVICE

Sakae Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 19, 1968, Ser. No. 785,259
Claims priority, application Japan, Dec. 26, 1967, 108819/67
Int. Cl. G11b *15/24*
U.S. Cl. 226—176 4 Claims

A device for preventing tracking deviation in transporting sensitive material between a pair of driving and driven rollers. The driven roller is supported at either end by indepen-

dent supporting arms, and each supporting arm is independently spring mounted on a common shaft to provide for engagement and disengagement of the rollers and also to provide uniform pressure of the driving roller during tracking.

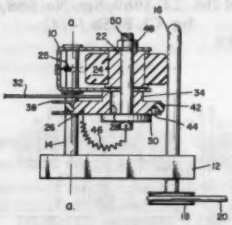


3,589,583

MECHANICAL RELAY APPARATUS

Stanley D. Tout, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 8, 1969, Ser. No. 822,937
Int. Cl. G11b *15/29*
U.S. Cl. 226—176 **13 Claims**



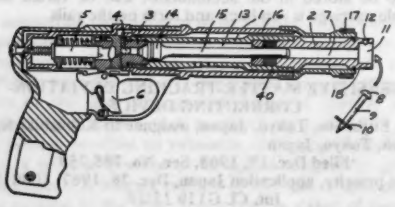
A mechanical relay apparatus, in combination with a rotating drive means preferably supplied by a web transport system, for switching a cooperative device from a first configuration to a second configuration and for maintaining the device in the second configuration until a resetting force is applied to the relay apparatus.

3,589,584

NAIL-DRIVING DEVICE

Borje Arvid Sixten Ohlsson, and Ture Erik Gunnar Ohlsson, both of Bromma, Sweden, assignors to Gunnebo Bruks AB, Gunnebobruk, Sweden

Filed Sept. 26, 1967, Ser. No. 670,611
Claims priority, application Sweden, Sept. 27, 1966, Apr. 3, 1967, 12954/66;4568/67
Int. Cl. B25c *1/14*
U.S. Cl. 227—10 **4 Claims**



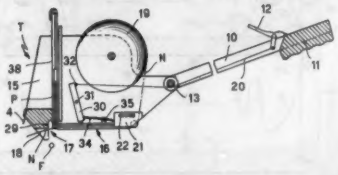
A nail-driving device for securing a mounting strap assembly to a wall. The strap assembly is in the form of a curved bendable strip which is pierced substantially at its mid portion by a headed nail the head of which is located at the inside of the strip curvature. The assembly is fittable into the muzzle portion of a gun-type nail-driving device and is propelled out of the device by pressure generated in the same and released by actuation of a trigger mechanism. The strap assembly when inserted in the muzzle portion of the device is steadied in the same so that it is propelled therefrom in a direction normal to the wall into which the nail of the assembly is to be driven.

3,589,585

DEVICE FOR THE APPLICATION OF TAPE TO WIRE

Renzo Giuseppe Cerioni, Corso Venezia, 10 Milan, Italy

Filed Sept. 20, 1968, Ser. No. 761,250
Claims priority, application Italy, Feb. 28, 1968, 13.317/68
Int. Cl. B25c *5/02*
U.S. Cl. 227—76 **4 Claims**



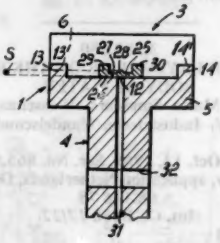
Device for the stretching and the application of tape material to discrete wires to form a framework structure, particularly for flower cultivation.

3,589,586

GUN FOR DRIVING IN NAILS

Dino Mazzer, Corso Italia 10, Conegliano Vento, (Province of Treviso), Italy

Filed June 30, 1969, Ser. No. 837,387
Claims priority, application Italy, July 4, 1968, 60238-A/68
Int. Cl. B25c *1/04*
U.S. Cl. 227—130 **2 Claims**



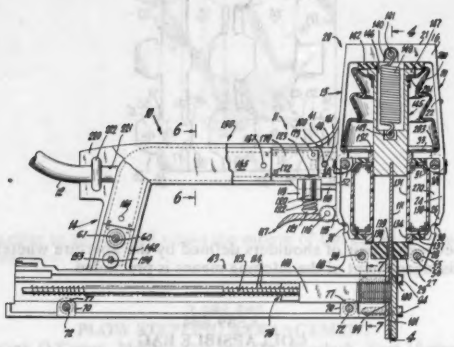
This disclosure relates to a pneumatic gun for driving in headless nails of very small diameter comprising a magazine for the nails, a head member provided with a guide channel having a reception groove for the nails extending to the exit of said channel and communicating with said magazine, means for feeding said nails from said magazine into said groove. The gun further comprises an elongated striker member slidably movable in said channel. This striker member has a cross section with a flat center portion, a flat face thereof and side legs projecting from said flat face and extending along the length of said striker member.

3,589,587

ELECTRICALLY OPERATED STAPLERS

George F. Manganaro, Lake Hiawatha, N.J., assignor to Allan Finishing Corporation, Saddle Brook, N.J.

Filed Apr. 16, 1969, Ser. No. 816,644
Int. Cl. B25c 1/06
U.S. Cl. 227—131 16 Claims



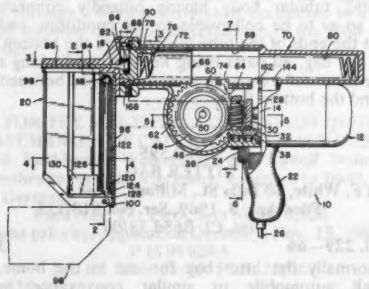
The circuit is for control of a winding or load coil in a stapler tool which when energized moves a plunger carrying a staple-driving blade. A trigger switch on the tool is manually actuated. The circuit is such that if the switch is closed and held closed, the winding will pulse alternatively current at predetermined regular intervals to energize the coil. If the switch is closed and then opened in less than said predetermined interval, only one pulse will be produced, until the switch is again closed. The pulse takes place at the beginning of a positive cycle of the alternating current. If the switch is repeatedly alternately closed and opened, the pulsing will follow the closing of the switch. The interval between pulses is present or variable. The casing for the tool is made of two split sections which when assembled grip the load coil. Said sections are of metal. A plastic sleeve surrounds the handle of the casing. The electrical parts are housed in the tool body in one form of the invention. In another, some of the electrical elements are in the plug.

3,589,588

IMPACT TOOL

George O. Vasku, 4925 Pelletier, Orchard Lake, Mich.

Filed July 14, 1969, Ser. No. 841,307
Int. Cl. B25c 1/06
U.S. Cl. 227—132 9 Claims



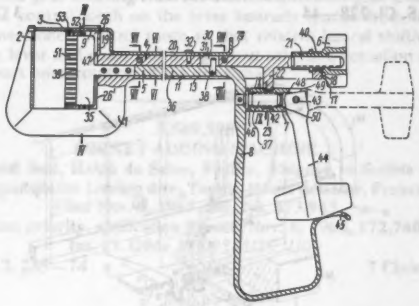
A hand-held impact tool usable, for example, as a nailing machine is disclosed. The tool includes a hammer which is retracted by means of an electric motor to compress a spring. A gear, driven by the motor, is caused to disengage from the hammer upon retraction thereof to permit forward movement of the hammer under the pressure of the compressed spring. Switch means are provided to prevent a repeat of the operating cycle except upon manual release and depression of a trigger. A fastener-feeding structure is detachably secured to the impact tool. Provision is made for changing the hammer and fastener-feeder magazine to permit use of different size and shape fasteners such as nails and staples.

3,589,589

SURGICAL INSTRUMENT FOR STITCHING TISSUES BY MEANS OF STAPLES

Ernest Mikhailovich Akopov, Nikonovsky pereulok, 9/2, kv. 6, Moscow, U.S.S.R.

Filed Sept. 18, 1968, Ser. No. 760,417
Claims priority, application U.S.S.R., Sept. 19, 1967, 1184885
Int. Cl. B25c 5/02
U.S. Cl. 227—153 8 Claims



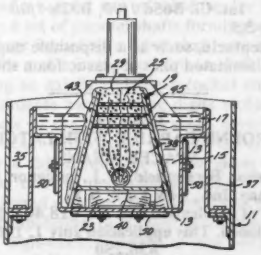
A surgical instrument comprises a support body with an open longitudinal channel, in which are respectively superposed the rod of a pusher member and the rod of a staple housing. A replaceable magazine with staples is secured to a head of the staple housing and drives are provided for moving the staple housing and pusher conjointly to clamp the tissue between the magazine and a jaw on the support body and for thereafter displacing the pusher relative to the staple housing to force staples from the magazine into the tissue.

3,589,590

SOLDERING APPARATUS

Robert D. Fitzsimmons, North Reading, Mass., assignor to State Street Bank and Trust Company, Boston, Mass.

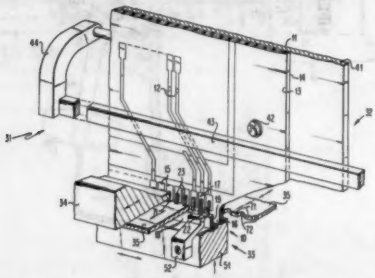
Filed Dec. 11, 1968, Ser. No. 782,824
Int. Cl. B23k 1/08
U.S. Cl. 228—37 5 Claims



Soldering apparatus comprising a sump for receiving molten solder covered with a layer of oil compound. A fountain is disposed centrally in the sump and forms a chamber having

an inlet disposed in the molten solder and an upwardly opening outlet disposed centrally in the sump and elevated above the surface of the oil compound. A pump is provided for pulling molten solder in through the inlet and discharging it out the outlet to form a wave over which, for example, printed circuit boards may be passed to solder a plurality of components thereto and form electrical leads between the components. The pump circulates the molten solder through the fountain and out the outlet at a rate sufficient to cause it to spill downwardly around the fountain to pass through the layer of oil compound and carry a sufficient quantity of such oil compound therewith and into the inlet of the fountain to provide a desired ratio of oil compound to solder in the wave.

3,589,591
BONDING APPARATUS
Carl W. Schwenn, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 634,289, April 27, 1967, Pat. No. 3,474,521.
Filed Aug. 6, 1969, Ser. No. 871,014
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 **3 Claims**



Two rows of terminal pins projecting from an adapter plug are soldered simultaneously to a like number of solder coated strips on both faces of a printed circuit board.

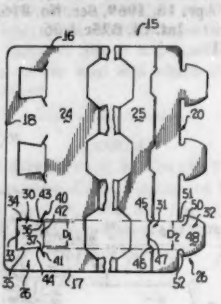
Clamping and carriage assemblies fixedly position one row of terminal pins opposite the strips on a respective face of the board. Heater blades are positioned opposite each face, bring the pins and strips together and melt the solder. Forming blades positioned opposite each row of pins stress the pins against the strip while the solder is still molten, simultaneously registering each pin with its respective strip.

3,589,592
FOAM RECEPTACLE
Ruben A. Tigner, Bay City, Mich., assignor to The Dow Chemical Company
Filed Mar. 1, 1967, Ser. No. 620,216
Int. Cl. B65d *1/00;* **B32b** *7/00*
U.S. Cl. 229—3.5 **17 Claims**

A foam receptacle, such as a disposable cup, having walls comprised of laminated plies of plastic foam sheet.

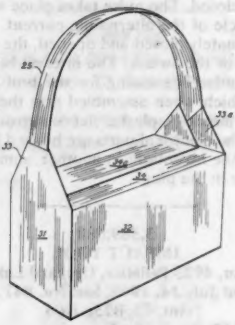
3,589,593
WRAP-AROUND CARRIER WITH LATCHING AND SPACER MEANS
Arthur J. Weiss, Bergenfield, N.J., assignor to Continental Can Company, Inc., New York, N.Y.
Continuation of application Ser. No. 618,467, Feb. 24, 1967, now abandoned. This application July 1, 1969, Ser. No. 838,250
Int. Cl. B65d *5/04*
U.S. Cl. 229—40 **12 Claims**

A wraparound type carrier having inner and outer terminal closure panels with cooperative latching means in the form of an aperture in the inner panel through which projects a tab of the outer panel. The tab includes an enlarged head disposed between transversely adjacent articles and a reduced neck portion of a size exceeding the distance



between a pair of shoulders defined by the aperture whereby disengagement of the latching means is precluded.

3,589,594
COLLAPSIBLE BAG
Svend Fischlein, Albertslund; Peter Karpf, Borkerod, and Jan K. Tragaardh, Lyngby, all of, Denmark, assignors to Svend Aage Fischlein, Albertslund, Denmark, by said Karp and said Tragaardh
Filed June 9, 1969, Ser. No. 831,677
Claims priority, application Denmark, June 7, 1968, Jan. 9, 1969, 2,657;114
Int. Cl. B65d *31/16, 33/06*
U.S. Cl. 229—54 **5 Claims**

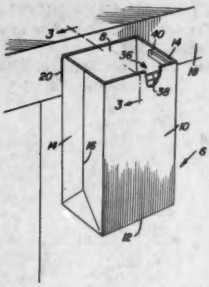


The invention provides a collapsible bag comprising a prismatic, tubular body having hingedly connected wall panels so as to be collapsible to flat condition, and hinged flaps at the ends of the tube to constitute the bottom and the top of the bag, all parts being kept in interlocking relationship by means of a carrying strap introduced between the top flaps and the bottom flaps.

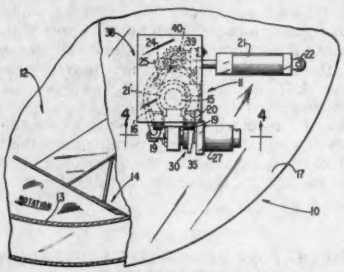
3,589,595
LITTER BAG
Robert F. White, 60 Dilla St., Milford, Mass.
Filed Apr. 3, 1969, Ser. No. 813,125
Int. Cl. B65d *33/00*
U.S. Cl. 229—66 **3 Claims**

A normally flat litter bag for use in the home, office, hospital, automobile or similar conveyance made of throwaway paper. A pressure sensitive adhesive strip is affixed across the rear wall and is covered with a peelable nonsticky tape which when stripped off, permits the openable mouth of the bag to be accessibly suspended. A sleeved bendably malleable wire bridges and is attached to the interior of the front wall and has extensible and retractable free

end portions which can be suitably angled and bent to span the customary folding creases of the bag's sidewalls in a manner to spread and retain the mouth of the bag in an open condition.



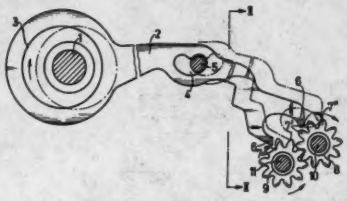
3,589,596
PLOW STEPPING ARRANGEMENT
Frank O'Conor, Moline, and John W. Sherlock, East Moline, both of, Ill., assignors to Ametek, Inc., New York, N.Y.
Filed July 30, 1969, Ser. No. 846,067
Int. Cl. B04b *1/00, 3/00*
U.S. Cl. 233—3 **10 Claims**



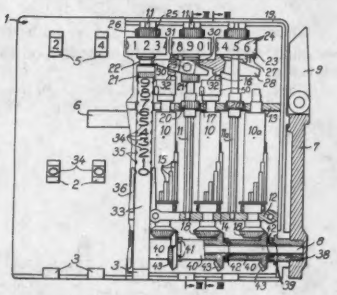
A centrifugal separator is provided with an unloader comprising a plow vertically within the rotary separator drum or basket and horizontally movable toward and away from the inner wall surface of the drum. After each downstroke of the plow a stepped cam is advanced one step and provides an adjustable stop member for limiting the horizontal movement of the plow. The plow is thus progressively moved inwardly toward the inner wall surface of the drum. The stepped cam is driven through a flexible drive shaft connected to a pinion advanced stepwise during each retraction of the plow after a downstroke.

3,589,597
DRIVE FOR THE MULTIPLICATOR AND/OR QUOTIENT MECHANISM OF CALCULATING MACHINES
Gottfried Burkhardt, Winkelhaid, and Rudolf Steinmeyer, Moorenbrunn, both of, Germany, assignors to Diehl, Nurnberg, Germany
Filed Nov. 14, 1969, Ser. No. 876,720
Claims priority, application Germany, Nov. 15, 1968, P 18 09 020.5
Int. Cl. G06c *23/00;* **F16h** *29/00*
U.S. Cl. 235—1 **5 Claims**

The specification discloses a drive arrangement for use in a calculating machine having a drive shaft. An eccentric on the drive shaft is engaged by one end of a lever which has at least one control tooth on the other end adjacent a gear to be driven. An intermediate region of the lever is guided along a path such that rotation of the drive shaft will oscillate the lever to move the control tooth along a closed path which is within the range of the teeth of the gear while the lever moves in one direction and outside the range of the teeth while the lever moves in the other direction. Also disclosed is a second gear meshing with the above-mentioned gear and a second control tooth on the lever laterally spaced from the first-mentioned control tooth so that relative lateral shifting of the lever and gears will bring about selective actuation of the gears upon rotation of the drive shaft.

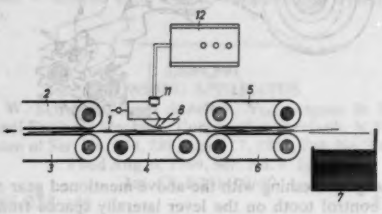


3,589,598
POCKET ADDING MACHINE
Fernand Suif, Hauts de Seine, France, assignor to Societe A Responsibilite Limitee dite: Topnit, Hauts de Seine, France
Filed Nov. 4, 1969, Ser. No. 873,943
Claims priority, application France, Nov. 6, 1968, 172,740
Int. Cl. G06c *27/00, 15/26, 1/00*
U.S. Cl. 235—74 **7 Claims**



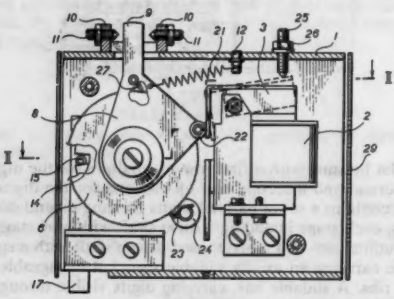
A flat housing with a first row of windows for the digits of an operand and a second row of windows for the digits of a result contains a set of parallel shafts forming several decadic stages, each stage including a drive shaft with nine staggered longitudinal ribs and a juxtaposed driven shaft with a splined profile carrying an axially slidable sprocket engageable with these ribs. A slidable bar, carrying digits visible through the operand window of the respective stage, serves to align the associated sprocket with one or more of the ribs of its drive shaft whereby a full revolution of the latter advances the driven shaft by one to nine angular steps; a wheel on the driven shaft, aligned with the result window of the stage, then displays a corresponding digit therein. A rocker arm controlled by the digit-wheel position of any lower-order stage engages another sliding sprocket on the driven shaft of the next-higher stage to align it with a tooth on the drive shaft of the latter stage for registering a carry; the drive shafts are rotatable from a common transverse input shaft in overlapping relationship to allow for successive transfers of a carry through several decades in one cycle.

3,589,599
METHOD AND APPARATUS FOR COUNTING OVERLAPPED SHEETS DURING CONVEYANCE THEREOF
Theo Brandt, Dusseldorf, Germany, assignor to Jagenberg-Werke A.G., Dusseldorf, Germany
Filed Nov. 8, 1968, Ser. No. 774,430
Int. Cl. B61l 1/16
U.S. Cl. 235—98 10 Claims



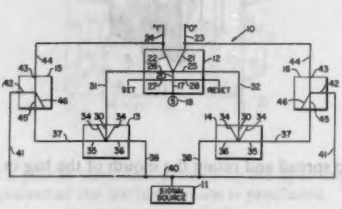
The invention is a method and apparatus for counting sheets of paper, cardboard or the like material which includes feeding successive sheets along a line of movement in overlapped condition, at a position along such line of movement and solely in accordance with the continued in-line movement of the fed sheets detecting successive overlaps and initiating a counting impulse responsive to each successive detected overlap.

3,589,600
ELECTROMAGNETIC COUNTER WITH SWITCHING MEANS
Bohuslav Vavrinec, and Frantisek Jagos, both of Prague, Czechoslovakia, assignors to Tesla, narodni podnik, Prague, Czechoslovakia
Filed Mar. 27, 1970, Ser. No. 23,307
Int. Cl. G06f 15/18
U.S. Cl. 235—132 4 Claims



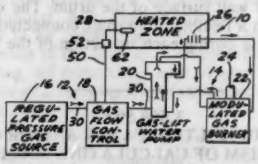
An electromagnetic counter of repeated operations provided with switching means for performing after a predetermined number of operations a certain action. A ratchet wheel with pawl means, with an oscillating crank arm actuated by an electromagnet is provided which transmits to the ratchet wheel the movement by way of a pawl. A circular plate with a radial slot is connected with the ratchet wheel cooperating with a bolt actuating a switch which for instance disconnects a supply circuit after a predetermined number of operations.

3,589,601
FLUIDIC BINARY COUNTER
David J. Schaffer, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Jan. 10, 1969, Ser. No. 790,904
Int. Cl. G06m 1/12
U.S. Cl. 235—201 7 Claims



The subject fluidic binary counter includes a bistable fluid amplifier with '0' and '1' state output ports, a pair of fluidic AND gates, a pair of fluidic NOT elements, a signal generator, and passages connecting the output port of one AND gate with the set control signal port of the amplifier and the output port of the other AND gate with the reset control signal port. The '0' state output port of the amplifier is connected with the inlet port of one NOT element, while the '1' state output port is connected with the inlet port of the other NOT element. The output ports of the NOT elements are connected, respectively, with one input port of one or the other of the AND gates. The signal line from the signal generator is connected with the remaining input ports of the AND gates and the control ports of the NOT elements. The introduction of a signal from the generator shifts the bistable amplifier from the instant state to the other state where it will remain until the introduction of the next signal.

3,589,602
TEMPERATURE RESPONSIVE FLUID FLOW THROTTLING MEANS
Walton W. Cushman, 36483 Gloucester Drive, Fraser, Mich.
Division of Ser. No. 714,649, Mar. 20, 1968, Pat. No. 3,514,034.
Filed Feb. 3, 1970, Ser. No. 8,209
Int. Cl. G05d 23/12
U.S. Cl. 236—98 7 Claims



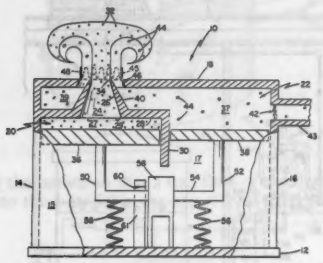
An automatic, self-modulating, gas-fired, gas-powered, forced-circulation residential or other hot water heating system, which is fully and efficiently operable without electricity or any other form of externally supplied power, other than the natural or other gas used for combustion, and includes a zone temperature-responsive control system which likewise requires no electricity or other external source of power.

3,589,603

VERTEX TRANSPORT

Timothy Fohl, Acton, Mass., assignor to Harry Eugene Stubbs, Lexington, Mass.

Filed Dec. 4, 1968, Ser. No. 781,084
Int. Cl. B05b 17/04
U.S. Cl. 239—11 12 Claims



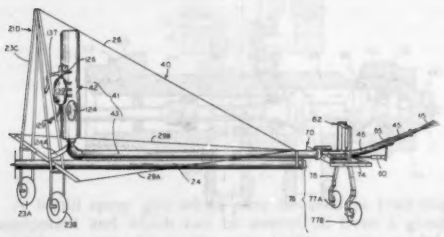
Moving a first fluid through a second fluid by incorporating the first fluid and a blanket fluid in a vortex having a surrounding outer layer of blanket fluid and impelling the vortex through the second fluid.

3,589,604

EXPLOSIVE BLAST-ACTUATED LIQUID DISTRIBUTORS FOR IRRIGATING APPARATUSES AND PROCESSES OF OPERATION THEREFOR

Dwaine M Paul, Amarillo, Tex., assignor to Jerry M. Moen, Lubbock, Tex.

Filed June 23, 1969, Ser. No. 835,539
Int. Cl. B05b 3/00
U.S. Cl. 239—11 22 Claims



An explosive blast-actuated liquid-distributing assembly is transported by and located at or near and operatively connected to the radial or outer end tower of a circular irrigation system for applying successive increments of water as a spray to successive sectors of corner areas extending to substantial distances from the end of that circular irrigating system.

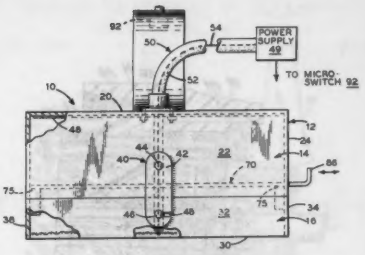
3,589,605

FLOCKING APPARATUS AND METHOD

Arthur Shectman, Huntington, N.Y., assignor to Perma-Vel Industries, Inc., Amityville, N.Y.

Filed Dec. 4, 1968, Ser. No. 781,007
Int. Cl. B05b 5/00; F23d 11/28
U.S. Cl. 239—15 4 Claims

Apparatus for flocking an article including a head having a chamber for storing the flocking material. An opening is provided in the head and electrode means is received in the head for charging the material and for creating an electric field which causes the material to exit through the opening. Control means is also provided in the head for selectively varying the rate of flow of the flocking material to prevent excessive deposits of material on the article.



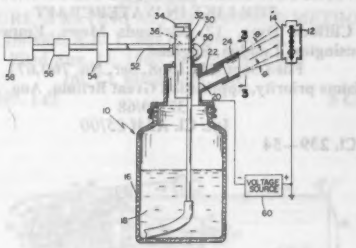
A method of applying the flock in spaced patterns also is disclosed.

3,589,606

ELECTROSTATIC SPRAY COATING APPARATUS

Frank Hamilton Fish, Westwood, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Dec. 23, 1968, Ser. No. 786,318
Int. Cl. B05b 5/02
U.S. Cl. 239—15 8 Claims



Apparatus for applying a shave facilitating coating to razor blades includes a chamber for holding the coating material and an aspirator for aspirating the coating material to form a mist of fine particles within the chamber. The chamber has a relatively large outlet port so that the mist of particles issue through the outlet port at a low velocity. The particles are then accelerated in an electrostatic field and are deposited on the sharpened edges of the razor blades in a uniform film having a thickness in the order of 2000 A. or less.

3,589,607

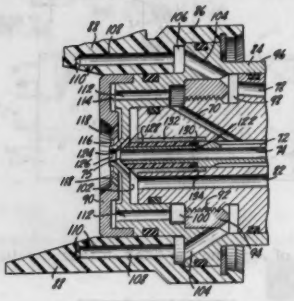
ELECTROSTATIC SPRAY GUN HAVING AN ADJUSTABLE SPRAY MATERIAL ORIFICE

Herbert S. Wolf, Denville; George Petino, Jr., Budd Lake, and Douglas C. Whritenour, Haledon, all of, N.J., assignors to Gourdine Systems, Inc., Livingston, N.J.

Filed May 28, 1969, Ser. No. 828,671
Int. Cl. B05b 5/02
U.S. Cl. 239—15 5 Claims

An electrostatic spray gun in which coating or other material is metered through an orifice adjustable in size to accommodate materials of various viscosities and consistencies and is thereafter atomized upon being injected as a conical fluid sheet into a central stream of high velocity air. Adjustment of the orifice and thus of the flow rate of the material is accomplished by rotating the spray head relative to the gun body. Further atomization of the material and development of the spray are produced by fluid streams exiting through an annular opening and other fluid orifices spaced around the spray outlet opening. The atomized particles are charged electrically by a rearwardly directed corona

discharge established between a corona electrode supported on the spray head and an attractor ring positioned on the spray head in surrounding relation to the spray outlet opening.



3,589,608

DEVICES FOR CLEANSING THE BILGE WATER AND THE LIKE IN WATERCRAFT

Roy Clifford Dyer, 12, McLeods Mews, Emperors Gate, Kensington, London, England

Filed Sept. 18, 1968, Ser. No. 760,671
Claims priority, application Great Britain, Aug. 2, 1968, 37100/68
Int. Cl. A24f *25/00*
U.S. Cl. 239—54 4 Claims

A water permeable container charged with an antimicrobiological compound, e.g. dichlorophen, which when inserted into water, e.g. ships bilge water, will cause the compound to be dispersed into the water as a dispersion for cleansing the water of microbiological organisms, the compound being noncorrosive to metals, acting over a temperature range found in watercraft and having a low toxicity to humans.

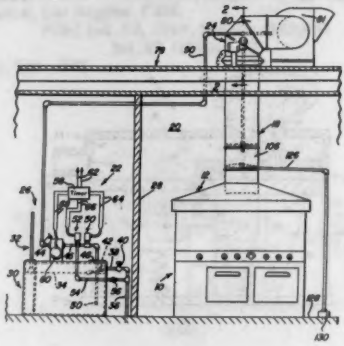
3,589,609

TIMED MOTORIZED FLUE CLEANING APPARATUS

Stuart C. Wyant, 809 Clay St., and Robert R. Fredinburg, 438 Eucluid, both of Ashland, Oreg.

Filed Dec. 10, 1968, Ser. No. 782,645
Int. Cl. B05b *1/28*
U.S. Cl. 239—120 9 Claims

An assembly including structure for applying cleaning liquid and then flushing liquid to the internal surfaces of at least one upstanding section of a flue line and for collecting and ducting away the liquids flowing downwardly the internal surfaces of the upstanding section by gravity.

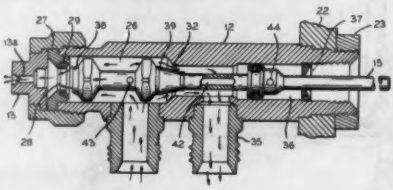


3,589,610

VARIABLE FLOW RATE SPRAY GUN WITH PRESSURE RELIEF

Fred W. Wahlin, St. Charles, and Ted Lee Butterfield, Naperville, both of, Ill., assignors to Spraying Systems Co.

Filed May 15, 1969, Ser. No. 824,856
Int. Cl. B05b *9/00*
U.S. Cl. 239—125 9 Claims



A variable pressure spray gun with an unloader valve built into the gun so that when the spray pressure is turned off fluid circulated to the gun is returned to the fluid system. Movable valves in the gun selectively direct all of the fluid developed in the pressure system through the outlet of the gun or through a bypass return line to the system and are arranged to selectively vary the pressure of the fluid delivered by diverting selected amounts of the pressurized fluid to the return line. The gun is arranged with counterbalancing fluid forces aiding a gun closing spring and with stop means for selectively limiting pressures delivered by the gun.

3,589,611

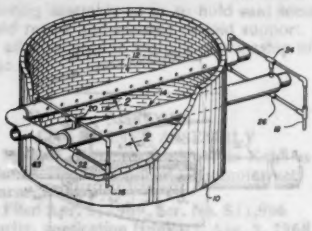
DISTRIBUTORS FOR INJECTING FLUIDS INTO VESSELS

John B. Jones, Jr., 5115 East Iliff Ave., Denver, Colo.

Filed Mar. 5, 1969, Ser. No. 804,616
Int. Cl. B05b *1/24*
U.S. Cl. 239—132 8 Claims

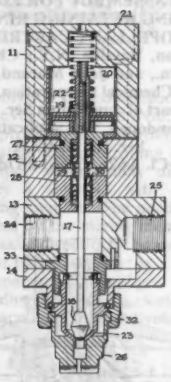
A fluid distributor for vessels includes a complete cooling jacket for at least the portion of the fluid distributor mounted

in and exposed to the interior of a vessel, and includes shielded outlet orifices to prevent particulate material from



blocking the outlets so that a free flow of the fluid may be injected into the material in the vessel from each outlet.

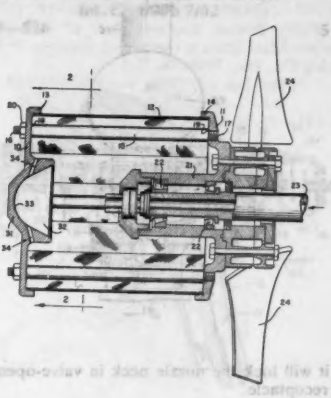
3,589,612
MODULAR LIQUID SPRAY GUN
William R. Shaffer, Huntingdon, Pa., assignor to Prismo Universal Corporation, Huntingdon, Pa.
Filed Dec. 22, 1969, Ser. No. 887,242
Int. Cl. B05b *1/24*
U.S. Cl. 239—139 **11 Claims**



A liquid spray gun which may be used in road-striping equipment and which can be assembled from a group of modules or interchangeable units. Utilizing some modules in common and some modified modules a variety of configurations can be formed including single-gun, double-body, double-nozzle or heated gun forms.

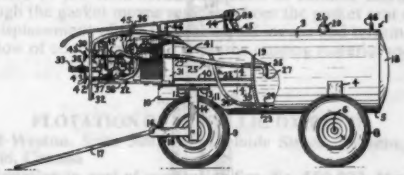
3,589,613
DEVICE FOR FERTILIZING AND/OR PEST CONTROL OF CROPS
John S. Saladin, 400 Farm, Rte #1, Easton, Md.
Filed Apr. 18, 1969, Ser. No. 817,380
Int. Cl. B05b *17/02*
U.S. Cl. 239—141 **3 Claims**

A rotating drum has a foraminous (wire mesh screen) cylindrical outer wall and inner foraminous panels zigzagged circularly around inside the drum adjacent the cylindrical outer wall and forming therewith a circular succession of cells into which fluid pesticide, fluid fertilizer or the like is admitted through the meshes of the panels and thence through meshes of the outer wall to atomize and break up the fluid into minute droplets or vapor, provision being made for automatically rotating the drum incident to movement of the airplane or other vehicle carrying the apparatus thereby causing the foraminous panels to cut through the fluid material supplied to the drum by an injection nozzle from a pressure source of fluid supply injected into the drum against a target having a frustoconical or parabolic (or hyperbolic) bowl adapted to reflect the incident stream in a conical sheet outwardly toward the foraminous panels and cylindrical



outer wall and through the openings or meshes of the panels and outer wall in the form of minute droplets and vapor to the outside atmosphere for settling on the growing crops.

3,589,614
PRESSURE SPRAYING APPARATUS AND METHOD
William L. Linville, R.R. 1, Box 8, Colby, Kans.
Filed Aug. 11, 1969, Ser. No. 849,053
Int. Cl. B05b *9/00, 9/02*
U.S. Cl. 239—142 **5 Claims**

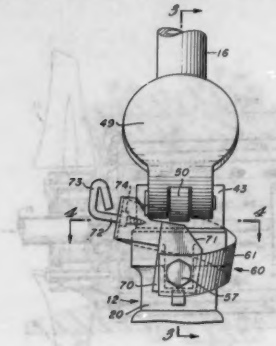


A pressure spraying apparatus for selectively spraying a cleansing solution, clear rinse water, or a mixture thereof, has a closed fluid-holding tank with a normally closed loading opening. A fluid supply is connected to the tank for replacing fluid as cleansing solution is withdrawn. The incoming fluid is being directed toward a quantity of undissolved detergent in the tank to agitate and dissolve additional detergent to maintain an effective cleansing solution in the tank. A pump and spray device provide a pressure discharge of fluid. The tank supply and discharge line include a bypass and valves for controlling same and pump connections for selectively discharging cleansing solutions or water or mixtures thereof. The tank has a shell extension housing operating equipment, valve and lines mounted for withdrawal for maintenance operations.

3,589,615
REACTION-POWERED SPRINKLER NOZZLE LOCK
Thomas A. Cummins, 26063 E. Baseline, Space 36, San Bernardino, Calif.
Filed Dec. 22, 1969, Ser. No. 886,947
Int. Cl. A01g *25/06;* **B65d** *63/00*
U.S. Cl. 239—201 **6 Claims**

A metal strap apertured at its opposite ends to be tied by an already available setscrew around a reaction-powered

sprinkler nozzle spring-valved receptacle to capture a thread-forming wing screw to penetrate said receptacle at a point



where it will lock the nozzle neck in valve-opening position in said receptacle.

3,589,616

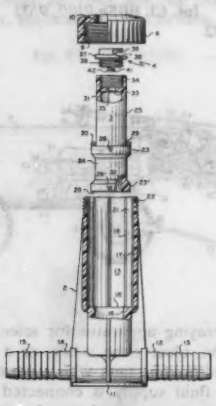
POPUP SPRINKLER

James R. Stephens, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Mar. 10, 1969, Ser. No. 805,783

Int. Cl. B05b *15/10*

U.S. Cl. 239—204 **9 Claims**



A popup sprinkler unit is provided for use in watering lawns, gardens, and the like which comprises an elongated casing the majority of which is located beneath the surface of the ground, a riser, and a removable cap having an opening therein, the riser extending through the opening in the cap when water pressure is applied to the unit. The riser is provided with a spray head having adjustable pressure means therein, and the configuration of the riser and casing is such that the riser can be removed from the casing.

3,589,617

EXHAUST-GAS-FLOW-DIVERTING APPARATUS FOR A JET ENGINE

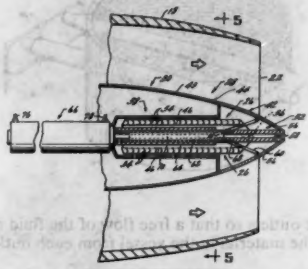
Arthur P. Adamson, Cincinnati, Ohio, assignor to General Electric Company

Continuation of application Ser. No. 780,327, Dec. 2, 1968, now abandoned. This application Mar. 2, 1970, Ser. No. 15,927

Int. Cl. B64c *15/04*

U.S. Cl. 239—265.31 **18 Claims**

A thrust-reversing or thrust-spoiling apparatus for a jet engine is provided having flow-diverting cascades which are movable between a position, wherein each cascade is housed in substantially noninterfering relationship to the flow of exhaust gases, and a position downstream of the exhaust gas outlet wherein the cascades are operative to divert and thereby either spoil or reverse the thrust normally produced thereby.



3,589,618

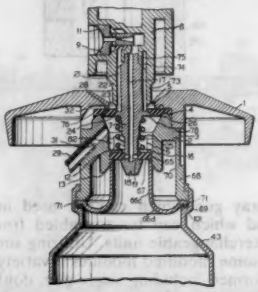
PLUG VALVE ASSEMBLY FOR FLUID PRODUCT DISPENSER HAVING RETAINING RING SUPPORTING A PROPELLANT CARTRIDGE

Marvin L. Thornton, Bayside, N.Y.; Charles D. Chambers, Huntington, Conn., and Jean Marand, Benoit, France, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Continuation-in-part of application Ser. No. 716,812, Mar. 28, 1968, now abandoned. This application Jan. 28, 1969, Ser. No. 814,221

Int. Cl. A62c *13/60*; **B67d** *5/54*

U.S. Cl. 239—307 **13 Claims**



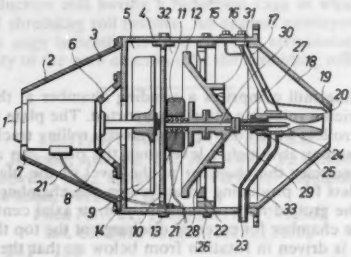
A retaining and sealing ring of a deformed sheet of flexible metal for a plug valve assembly for dispensers of fluid products adapted to be attached to a product container for containing the fluid product to be dispensed. The product container accommodates a propellant cartridge within the product container. The plug valve assembly has a hollow valve stem with a pushbutton actuator on the upper end of said stem which has a nozzle therein communicating with said hollow stem. A cap member fits over a product container and has an aperture therein through which the hollow stem is movable, and a support is secured to the under side of said cap and has a hollow central portion through which said hollow stem is movable. A dip tube is secured in said support and opens into said hollow interior, and a fluid product flow path extends through said hollow stem exteriorly of the hollow thereof from a point adjacent said hollow interior. A first flexible gasket means is positioned in said plug valve assembly through which said hollow stem passes for obturating said fluid product flow path between said fluid product flow path and said hollow interior. The support has a downwardly open recess therein, and a second flexible gasket means is

positioned in the bottom of said recess through which said hollow stem passes. The hollow stem has an aperture therein opening into the hollow of the stem, said aperture being obturated by said second flexible gasket means. The retaining ring of the invention is of aluminum or the like and may be deformed during assembly so as to hold said second gasket means in said recess and secured to said support. It has the outer lower edge secured in gastight relationship to a propellant cartridge.

3,589,619
GAS BURNER ASSEMBLY

Attila Biro, Miskolc, Hungary, assignor to Koho-es Gepipari Miniszterium Tuzelestechnikai Kutatointezet, Miskolc-Egyetemvaros, Hungary

Filed Apr. 1, 1969, Ser. No. 811,996
Claims priority, application Hungary, Apr. 8, 1968, BI-300
Int. Cl. F23d *13/38*
U.S. Cl. 239—415 **7 Claims**



Fuel burner assembly for the combustion of gaseous fuels with a heating value over 3,000 Kcal./Nm.³ in which one and the same member is provided for controlling output, keeping the flame length constant and controlling the air-gas proportion. The said member is an axially displaceable mixing member actuated by a solenoid with a soft iron yoke mounted on the mixing member. The needle of the valve for the gas is also mounted on the mixing member having means for engaging it in an axial direction. The casing of the burner is divided into at least two chambers, by a dividing ring, said chambers being connected by passages. Both the mixing member and the dividing ring have a closing surface serving to close the aperture arranged in said dividing ring.

3,589,620
GAS BURNERS

Frederick Charles Davis, Knoxville, Victoria, and Leslie Barson, Ormond, Victoria, both of, Australia, assignors to Companion Heaters Proprietary Limited, Victoria, Australia

Filed July 15, 1968, Ser. No. 744,953
Claims priority, application Australia, July 25, 1967, 25012/67
Int. Cl. F23d *13/00*
U.S. Cl. 239—434 **2 Claims**

In a gas burner assembly, a unitary sheet metal base member and a unitary sheet metal cover member, the cover member includes an annular portion having an upstanding, substantially frustoconical portion adapted to house a burner head and a radially extending flat portion, the base member has a closed bottom and a gas duct extending therefrom for supplying gas to the burner head, and the cover member has a flange around its periphery turned down over the periphery of the base member to unite the base member and the cover member.

3,589,621
SPRAY DEVICE

Richard C. Bradley, Fort Lauderdale, Fla., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

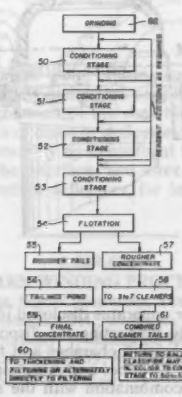
Filed Feb. 28, 1969, Ser. No. 803,339
Int. Cl. B05b *7/02*
U.S. Cl. 239—526 **5 Claims**

A valve assembly for a spray gun which controls the flow of a fluid from a fluid source to a fluid-actuated means. The valve assembly includes a valve sleeve having a gasket seat at opposite ends thereof. First and second movable gasket means are cooperatively associated with each gasket seat. The valve sleeve and the gasket means cooperate to define a chamber which is connected to a fluid-actuated means. An actuator is adjacent a means carrying the gasket means for moving either the first or the second gasket means into engagement with the cooperatively associated gasket seat thereby either connecting the fluid-actuated means causing displacement of the fluid-actuated means and flow of coating material from the coating material source or disconnecting the fluid source from the fluid-actuated means and allowing the fluid in the fluid-actuated means to exhaust therefrom through the gasket means removed from the gasket seat causing displacement of the fluid-actuated means and terminating the flow of coating material from the coating material source.

3,589,622
FLOTATION OF METALLIC OXIDES III

David Weston, Suite 500, 129 Adelaide Street, Toronto, Ontario, Canada

Continuation-in-part of application Ser. No. 550,922, May 18, 1966, now abandoned , and a continuation-in-part of 564,033, July 11, 1966. This application Apr. 24, 1967, Ser. No. 633,241
Int. Cl. B02c *17/00*; B03d *1/02*
U.S. Cl. 241—16 **51 Claims**



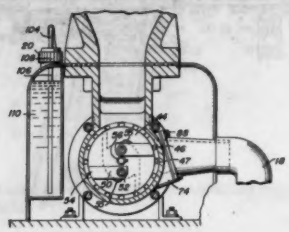
A process for the flotation of metallic oxides in which a dispersed pulp is conditioned in a number of stages to

achieve differential flocculation of the metallic oxides and dispersion of the gangue materials prior to flotation.

3,589,623
GRINDER AND PUMP UNIT

William Perry Belden, deceased, late of Millville, N.J. (by Katherine Arnel Belden, executrix), assignor to Raritan Engineering Co., Inc., Millville, N.J.

Filed Jan. 23, 1968, Ser. No. 699,915
Int. Cl. B02c *13/04, 13/28, 13/286*
U.S. Cl. 241—46.02 **1 Claim**

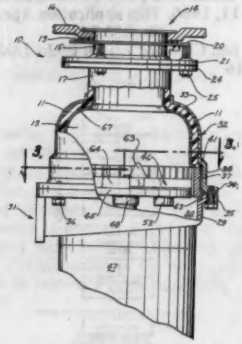


An electrically driven marine toilet including an integral grinder assembly for operating upon the waste discharged from a commode. The grinder assembly cooperates with a centrifugal impeller-type discharge pump for effectuating disposal of waste from the commode. An electric motor also drives a rotary pump which supplies the commode with a supply of water. A check valve assembly connected with the rotary pump intake is adapted to receive a chlorinated liquid to be mixed with the commode water supply. Accordingly, an electric motor simultaneously drives the grinder and discharge pump assemblies as well as the commode water supply pump.

3,589,624
WASTE DISPOSER WITH LINER

Thomas R. Smith, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Oct. 24, 1968, Ser. No. 770,291
Int. Cl. B02c *13/16, 13/282, 18/42*
U.S. Cl. 241—46.08 **10 Claims**

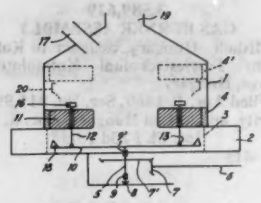


The waste disposer apparatus disclosed includes a resilient housing for resiliently supporting the disposer in a sink and for defining a comminution chamber and further includes a stainless steel liner for the comminution chamber. The resilient housing in combination with the substantially non-resilient, noncorrosive, and wear-resistant stainless steel liner provides a quiet, long life, waste disposer apparatus.

3,589,625
GRINDING MILL

Jean Desbordes, Paris, France, assignor to Stein & Roubaix, Paris, France

Filed Oct. 23, 1968, Ser. No. 770,025
Claims priority, application France, Oct. 25, 1967, 125838
Int. Cl. B02c *15/08*
U.S. Cl. 241—52 **5 Claims**

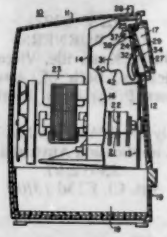


A grinding mill comprises a grinding chamber at the bottom of which a rotatable plate is supported. The plate carries pivotable rollers which are urged against a rolling track fixed in the chamber at a higher level than the plate. An air distributor encircles the chamber at the level of the plate and has air inlets for producing an airflow in the chamber which conveys the ground material upwardly in an axial central region of the chamber for external discharge at the top thereof. The plate is driven in rotation from below so that the entire region of the chamber above the center of the plate is completely open.

3,589,626
ICE CRUSHER

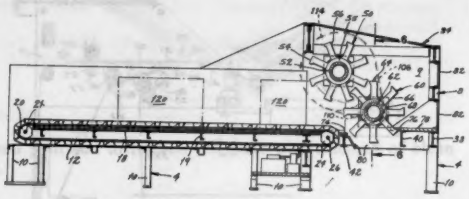
Richard F. Saurer, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1968, Ser. No. 774,909
Int. Cl. B02c *19/12, 13/282, 13/286*
U.S. Cl. 241—100 **5 Claims**



Ice crusher apparatus provided with a plurality of closure members for the feed opening thereof. Two of the members are hingedly attached adjacent the upper end of the feed opening and are spring biased such that one member registers with the opening while the other one is away from the opening. A third closure member is hinged along the lower edge of the opening and is capable of assuming a substantially horizontal position for serving as a shelf for supporting ice to be fed into the crusher. The member biased away from the opening serves as a pusher door which moves the ice from the shelf through the opening while preventing entry of the fingers into the crusher and rendering the crusher capable of chain feeding. The door normally biased into registry with the opening prevents ice chips from flying out of the ice crusher opening when the chain feeding is not employed.

3,589,627
REDUCTION MILL
James L. Torrence, St. Louis, Mo., assignor to American Pulverizer Company, St. Louis, Mo.
Filed Nov. 21, 1968, Ser. No. 777,736
Int. Cl. B02c *13/06, 13/20, 13/286*
U.S. Cl. 241—186 11 Claims



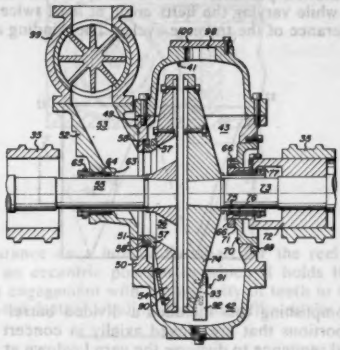
A reduction mill having a reduction cage in which a feed roll and shredding roll revolve. An endless conveyor extends into the cage beneath the feed roll and terminates in close proximity to the path described by the shredding roll.

3,589,628
ROTARY SHELL PULVERIZER
Allen S. Jackson, Atlanta, Ga., and Albert E. Henderson, Jr., Jacksonville, Fla., assignors to Fertilizer Equipment Sales Corporation, Doraville, Ga.
Filed Nov. 27, 1968, Ser. No. 779,367
Int. Cl. B02c *13/00, 13/282, 23/02*
U.S. Cl. 241—186 6 Claims

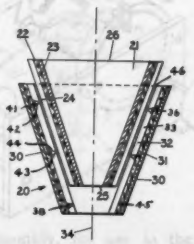
The pulverizer includes a rotary shell or drum which is mounted for rotation on a slightly tilted axis, and in which materials, including fertilizer chemicals and the like, are fed in a solid state to the interior of the drum for comminution. The inside curved surface of the drum is provided with a continuous array of small cups or flights for receiving deposits of larger particles of material received and which carry them to an upper portion of the drum when rotated for emptying therefrom. The drum has covers for the ends of the drum and openings in the center for receiving material at the one end and for spilling it from the other end. Particles dropped from the inclined flights on the upturning side of the drum are passed to a breaker means for pulverizing the material. Large particles that remain are collected at the bottom and are received in the inclined flights for again passing to the breaker means, and the tilt of the drum together with the length thereof provide many passes of the material through the breaker until all material spilled from the exit cover end is finely comminuted.

3,589,629
REFINER INSTALLATION
Donald P. Michel; Herman W. Steiniger; Franklin F. Landis, and Lawrence E. Skeen, all of Springfield, Ohio, assignors to The Bauer Bros. Co., Springfield, Ohio
Filed Sept. 16, 1966, Ser. No. 580,114
Int. Cl. B02c *1/08;* B02b *1/00*
U.S. Cl. 241—251 14 Claims

An improved refiner installation characterized by a simplified base structure comprising a unique arrangement of integral lightweight unitized plates resistant to vibration and simply mounting in an optimal relation thereto an improved disc refiner assembly characterized by a refining chamber the surface portions of which are arcuate to form a pressure-resistant housing for the refining discs which like the base is fabricated of thin material. The invention also provides means advantageously and selectively adapting the installation optimally to function for pressurized refining or conventional refining. The refiner housing is further characterized by a segmented form lending economy of fabrication and simplicity of maintenance.



3,589,630
HELICAL DEFLECTOR FOR TRUNCATED CONICAL PAPER REFINERS
Donald W. Danforth, Andover; Frank H. Russell, Andover, Mass.; Vincent J. Brindle, Salem Depot, N.H. and Charles E. Fisk, Andover, Mass., assignors to Bolton-Emerson Inc., Lawrence, Mass.
Filed Jan. 15, 1969, Ser. No. 791,340
Int. Cl. B02c *19/00*
U.S. Cl. 241—260 5 Claims

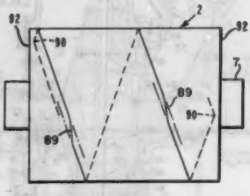


A truncated conical pulp refining engine, such as a "Claflin" engine, is provided with a continuous, helical row of deflectors in the channels of the shell blades, the plug blade channels being free of dams or deflectors. Stock to be refined is thus thrown outwardly by centrifugal force from the plug channels, across the interface, and directed back across the interface by the helical deflectors, for improved refining effect.

3,589,631
YARN WINDING PROCESS
Uel Duane Jennings, Signal Mountain, Tenn., and Wayne Clifford Sparling, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 13, 1969, Ser. No. 865,550
Int. Cl. B65h *54/28, 54/32, 55/00*
U.S. Cl. 242—18 8 Claims

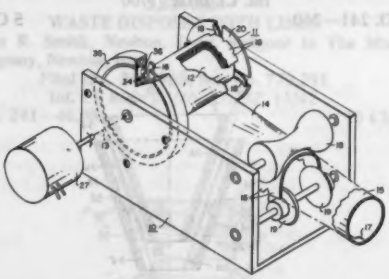
A process for winding yarn into a cylindrical-bodied substantially straight-ended package wherein the yarn is traverse

wound in layers of helical coils on a bobbin by traversing the yarn axially through successive stroke lengths in repeating time periods to form a package and wherein two successive stroke lengths form a traverse cycle. The improvement includes the steps of progressively decreasing the stroke length to a first value then increasing the stroke length to a second value within 50 percent of the duration of each of the time periods, while varying the helix angle at least twice during a preponderance of the traverse cycles. The winding apparatus



for accomplishing this includes a divided barrel cam with sliding portions that are moved axially in concert in a programmed sequence to disperse the yarn laydown at the reversals. Yarn packages of improved formation and stability are wound using the process and apparatus of this invention. The packages are formed of a plurality of layers of helical coils, wherein each coil includes successive helical and reversal portions and are characterized by having at least two inflections in the helical portions of a preponderance of the coils.

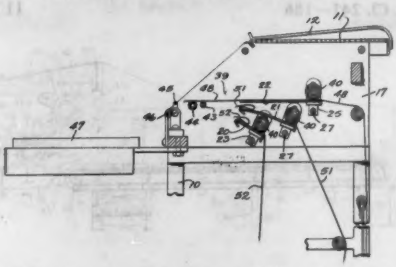
3,589,632
SELF-FORMING-BOOM STORING AND DEPLOYING APPARATUS
James A. Rew, Reistertown, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 30, 1969, Ser. No. 820,468
Int. Cl. B65h *75/00*
U.S. Cl. 242—55 **2 Claims**



Improved apparatus which stores and deploys rolled-up thin, springlike, strip material that self-unwinds and curls outwardly at its edges into a hollow tubular boom when freed of its wound state. Self-adjusting means radially constraining the edges of the outermost winding of the rolled-up strip maintains same compactly wound on the storage reel during self-unwinding, and one-way ball-type centrifugal brake means on the reel stabilizes the strip-unwinding rate while permitting unrestrained reel rotation in the winding direction.

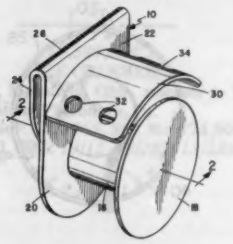
3,589,633
FILM SELECTOR
John T. Young, Lake Bluff, Ill., and Gilbert M. Hagemann, Franksville, Wis., assignors to Wrapping Machinery Company, Inc., Franksville, Wis.
Filed Jan. 21, 1969, Ser. No. 792,535
Int. Cl. B65h *19/04*
U.S. Cl. 242—55.3 **5 Claims**

This disclosure relates to wrapping apparatus having a plurality of rolls of wrapping film, a film-handling station to which the free ends of the film are brought in the course of using the apparatus, and a film selector between the rolls and the station. The film selector comprises a shelf for each film web, a film restrainer for each shelf to capture the film web



trained thereover, and pivotal mountings on which at least some of the said shelves are individually and independently swingable into and out of a position for handling the film at said station.

3,589,634
MULTIROLL SURVEYOR RIBBON DISPENSER
Edwin C. Mason, El Cajon, Calif. 4655 Lamont #304 San Diego, Calif. 92109
Filed Sept. 8, 1969, Ser. No. 855,954
Int. Cl. B65h *19/04*
U.S. Cl. 242—55.3 **6 Claims**

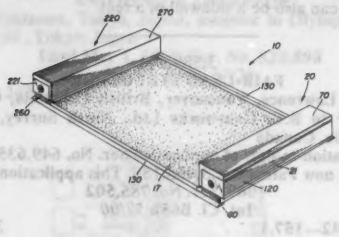


A spool for carrying a plurality of rolls of surveyor ribbon, which spool has a flange at one end with a carrying handle with a projection that projects radially over the ribbon rolls and has apertures for guiding the free ends of the unwound ribbon. The spool has a removably flange at the other end for holding the rolls of ribbon on the spool and also has resilient detent means for resiliently and frictionally holding the plurality of rolls of ribbon so that ribbon unwinds only when the free end of the ribbon is pulled.

3,589,635
CONTINUOUS RUG-POSITIONING APPARATUS
Elmer C. Brueckheimer, Cleveland, Tenn., assignor to American Uniform Company, Cleveland, Tenn.
Filed Feb. 24, 1969, Ser. No. 801,564
Int. Cl. B65h *17/00, 19/02*
U.S. Cl. 242—67.3 **9 Claims**

There is disclosed a continuous rug-positioning apparatus for maintaining a length of clean rug in a predetermined traffic path, the rug-positioning apparatus comprising a dispensing cabinet disposed in use adjacent to the predetermined path, a dispensing rug support in the dispensing cabinet for supporting the associated supply of clean rug, a takeup cabinet disposed in use adjacent to the predetermined path and spaced from the dispensing cabinet, a takeup rug support in the takeup cabinet for supporting the soiled rug, and means for dispensing a length of clean rug from the supply thereof into the predetermined traffic path and for taking up a like length of soiled rug from the predetermined

traffic path onto the takeup rug support, whereby periodically to remove a length of soiled rug from the predetermined path and to replace the same with a length of clean rug.

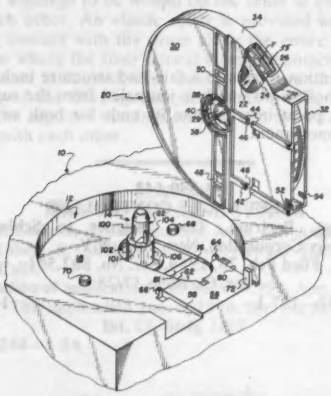


3,589,636

SPINDLE CONSTRUCTION AND MEANS FOR LOCATING A CARTRIDGE WITH RESPECT TO MOTION PICTURE PROJECTOR OR THE LIKE

Morris E. Brown, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 25, 1969, Ser. No. 836,300
Int. Cl. B65h *17/02*
U.S. Cl. 242—68.3 **7 Claims**



A reel for processed motion picture film or other web material positioned within a cartridge is mounted for movement with respect to the cartridge by means of a spindle that projects through a centrally located opening within the reel. The spindle is pivotal about a point located at the center of a spherical element, and the pivot point preferably is located at the center of mass of the rotating parts. This spindle construction permits adjustment of the axis of rotation of the reel so that the reel can wobble and so that flanges of the reel which might otherwise contact walls of the cartridge can move away from the cartridge walls, thus reducing friction therebetween. Provision is made for both horizontal and vertical positioning of the reel. In addition, improved means for locating or orienting a cartridge to respond to dynamic forces encountered during rotation of the reel within the cartridge.

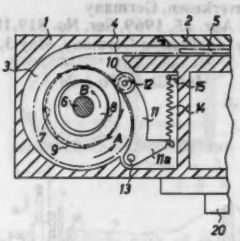
3,589,637

TAKEUP REEL FOR PHOTOGRAPHIC APPARATUS

Karl Wagner, Ottobrunn, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 28, 1969, Ser. No. 870,021
Claims priority, application Germany, Oct. 31, 1968, G 68 04 957.0-7501
Int. Cl. B65h *75/28*
U.S. Cl. 242—71.1 **10 Claims**

A takeup reel which is used in cameras having means for automatically threading the leading end of the film comprises an annulus of teeth which engage and hold the leading end of roll film while the reel rotates about its axis to convolute the film around its core, and a washer which is rotatable with radial clearance on a hub of the shaft for the reel and is biased to an eccentric position in which it holds the film away from engagement with the majority of teeth to thus insure more satisfactory winding of exposed film on the core.

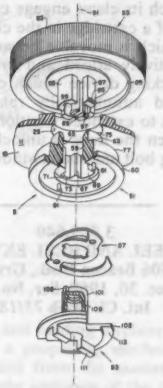


3,589,638

FILM-WINDING ASSEMBLY

Paul J. Ernisse, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1969, Ser. No. 802,780
Int. Cl. G03b *1/10*
U.S. Cl. 242—71.3 **6 Claims**

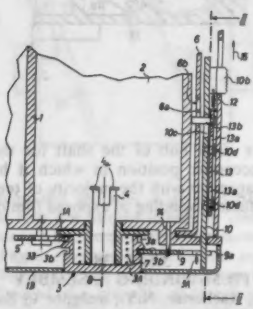


A film winding assembly, for use in the film winding mechanism of a photographic camera or other device, comprises essentially three parts which can be molded from plastic material without machining. The parts can be simply and rapidly assembled into a camera film-winding mechanism without separate threaded or other locking elements, and, once assembled, the assembly cannot be disassembled from the exterior of the device. The assembly includes: 1) a manual winding member having first and second resilient latching fingers; 2) a bearing member adapted to be rotatably mounted in a housing wall of the device and having means engaged by the first latching fingers for latching the bearing member to the winding member; and 3) a locking member including means cooperative with the first and second latching fingers of the winding member for latching the locking member to the winding member and for preventing unlatching of the winding member from the bearing member. In the preferred arrangement disclosed, the locking member also includes a clutch element movable between a lowered position for engaging a corresponding clutch element on a film winding spool and a raised position for disengaging the spool clutch element.

3,589,639
FILM REWINDING MECHANISM FOR PHOTOGRAPHIC APPARATUS

Dieter Engelsmann, Unterhaching, and Rolf Schroder, Munich, both of, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 25, 1969, Ser. No. 819,188
Claims priority, application Germany, May 3, 1968, A 29 731
Int. Cl. G03b *1/04*
U.S. Cl. 242—71.6 12 Claims

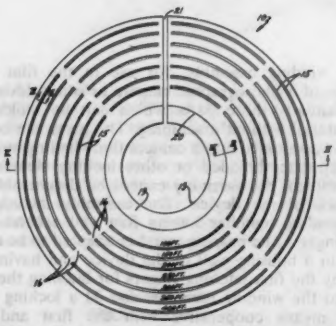


A still camera wherein a film rewinding knob is rotatable by the film transporting mechanism and is movable axially between an extended position in which it is disengaged from a cartridge in the chamber of the camera body and an operative position in which its claws engage complementary claws on the supply reel of a cartridge in the chamber. The camera body has a door which is movable between open and closed positions to respectively afford and prevent access to the chamber, and a locking device which can lock the door in closed position and automatically releases the rewinding knob for movement to extended position under the action of a helical spring when the door is unlocked. The connection between the locking bolt and the rewinding knob comprises a two-armed lever.

3,589,640
FILM REEL AND REEL EXTENSION

George H. Mapes, 506 Beacon Blvd., Grand Haven, Mich.

Filed Dec. 30, 1969, Ser. No. 889,127
Int. Cl. B65h *75/18*
U.S. Cl. 242—71.8 16 Claims

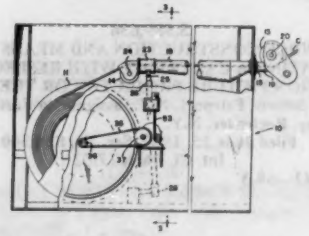


An annular disc has an annular depression extending from its inside circumference to a shoulder. The shoulder extends in a circle around the inside surface of the disc. The disc can be attached to a reel sidewall by means of the annular depression and the shoulder engaging the circumference of the reel sidewall. The disc has a plurality of arcuate slots forming concentric breakaway circles. It also has a loading slot extending through it from its inner to its outer circumference. By being constructed integrally with a core, the annular disc can also be a sidewall of a reel.

3,589,641
FAIR-LEAD STRUCTURE

Frank L. Lawrence, Vancouver, British Columbia, Canada, assignor to B.C. Gearworks Ltd., North Surrey, British Columbia, Canada

Continuation-in-part of application Ser. No. 649,635, June 28, 1967, now Patent No. 3,458,153. This application Feb. 4, 1969, Ser. No. 785,502
Int. Cl. B65h *57/00*
U.S. Cl. 242—157.1 3 Claims

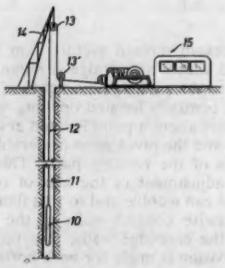


The invention relates to a fair-lead structure including an elongated hollow jib which is journaled from the supporting frame at a point intermediate its ends for both swivel and transverse movement.

3,589,642
FLEET ANGLE CONTROLLER

Leon Blagg, Bertram, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 26, 1969, Ser. No. 802,501
Int. Cl. B65h *57/28*
U.S. Cl. 242—157.1 14 Claims



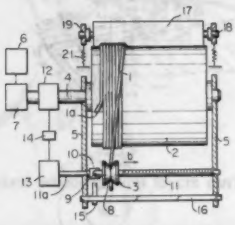
An illustrative embodiment of the present invention in apparatus for use in controlling the fleet angle of cable being spooled onto a drum includes first and second sheaves for routing the cable to the drum, said sheaves being mounted for pivotal movement about a pivot axis which is perpendicular to a plane containing the rotation axis of the drum, and means for mounting said sheaves in such a manner that forces due to cable tension pass through said pivot axis, whereby cable tension causes at least one of said sheaves and said pivot axis to lie in a common plane and the elevation of said one sheave with respect to said pivot axis to determined the fleet angle of the cable with respect to the drum.

3,589,643

METHOD FOR WINDING A FIBER OPTICAL ELEMENT AND DEVICE THEREFOR

Tatuo Takizawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 1, 1969, Ser. No. 820,898
Int. Cl. B65h 57/28
U.S. Cl. 242—158.2 4 Claims



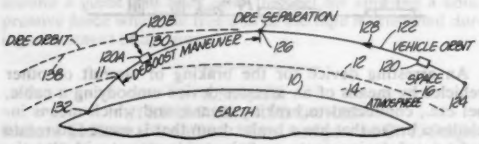
Method and device for winding at least one thin elongated fiber optical element onto a rotating drum so as to form a closely wound coil of the fiber optical element in making a fiber optical system from the coil. The fiber optical element is fed to the drum from a direction in retard of the displacement of the point on the drum at which the fiber optical element successively contacts the drum so as to be wound thereon as the drum rotates, thus permitting the fiber optical element windings to be wound on the drum in close contact with each other. An elastic roller is provided in elastically pressing contact with the drum along the entire portion on the drum where the fiber optical element contacts the drum as the same is rotated, thus positively preventing adjacent windings of the fiber optical element to overlap while permitting the adjacent windings on the drum to be kept in close contact with each other.

3,589,644

SELF-REFERENCING SYSTEM

Robert J. Salkeld, 410½ Landfair Ave., Los Angeles, Calif., and Robert S. Skulsky, 5337 Crestwind Drive, Rolling Hills, Calif.

Continuation of application Ser. No. 720,991, Apr. 12, 1968. This application Jan. 6, 1970, Ser. No. 511
Int. Cl. B64g 1/00
U.S. Cl. 244—1 SA 3 Claims



A vehicle, either a missile traveling in a trajectory or a space vehicle traveling in orbit, separates on command into two components by deboosting one of such components. The other component continues in trajectory or in orbit without substantially any speed reduction and serves as a traveling reference point for controlling the flight of such deboosted component.

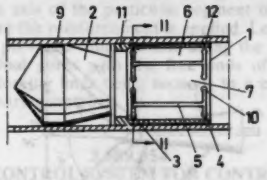
3,589,645

FOLDOUT FINS FORMING STABLE FLIGHT FOR A NONSPINNING PROJECTILE

Nils Edvard Haglund, Eskilstuna; Lennart Johansson, Torshalla, and Knut Goran Knutsson, Eskilstuna, all of, Sweden, assignors to Forsvarets Fabriksverk, Eskilstuna, Sweden

Filed Aug. 4, 1969, Ser. No. 847,189
Int. Cl. F42b 13/32
U.S. Cl. 244—3.27 3 Claims

A steering tube for a nonspinning projectile consisting of a tube body that is provided with a number of slits in it which define fins between them. Weakenings are provided in the body and which are arranged so that the fins can swing outwardly on these weakenings to enable the fins to become extended parallel to the flight path of the projectile to thus reduce air drag. The fins fold out under the pressure of the driving gas as the projectile leaves the barrel.

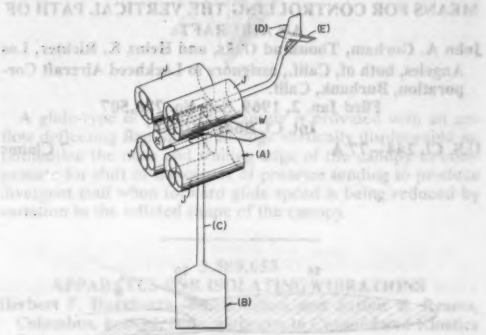


3,589,646

VERTICAL TAKE-OFF AND LANDING AIRPLANE

Kuninor Mori, Fujisawa Danchi 22—402, No. 13, 1-chome Fujigaoka; Fujisawa Danchi, Fujisawa-shi Kanagawa-Ken, Japan

Filed Dec. 24, 1968, Ser. No. 786,605
Int. Cl. B64c 27/22
U.S. Cl. 244—7 15 Claims



A vertical takeoff and landing airplane including a master body provided with a propelling mechanism, and a subordinate body suspended from the master body solely by a universal joint, whereby variation of the direction of the output of said propelling mechanism will cause change from vertical to horizontal flight. The propelling mechanism may include a varying number of groups, each formed of several engines, arranged in varying configurations. In certain embodiments a winged fuselage is provided between upper and lower groups of engines and a leg including a tail plane at the rear is extended from the master body, and the centroid of the master body and the universal coupling to the subordinate body are located in the same point. In other embodiments the point of application of the propulsion forces of the master body are displaced axially of the centroid of said body and the universal joint supporting the subordinate body is shiftable along said axis to vary the spacing thereof from the point of application of the propelling force.

3,589,647

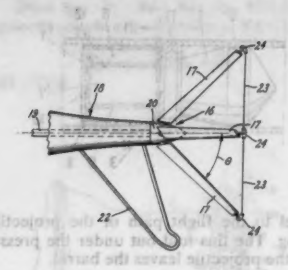
ANTITORQUE AND PROPULSION ROTOR

John E. Burkham, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 19, 1969, Ser. No. 886,714
Int. Cl. B64c 27/82
U.S. Cl. 244—17.21 8 Claims

A combined antitorque and propulsion rotor for use in vertical lift aircraft of the helicopter type, such as compound

helicopters or convertiplanes. The rotor comprises coned, rigid blades preferably inclined at a cone angle of between 45° and 60° with respect to the longitudinal axis of the aircraft. Collective and cyclic pitch means are provided for varying the pitch of the blades and consequently varying the thrust, antitorque and lifting forces exerted by the rotor on the aircraft.

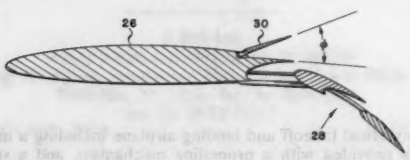


3,589,648

MEANS FOR CONTROLLING THE VERTICAL PATH OF AN AIRCRAFT

John A. Gorham, Thousand Oaks, and Heinz K. Richter, Los Angeles, both of, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 2, 1969, Ser. No. 788,507
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 A 7 Claims



A system is described for automatically controlling spoilers in the wing of an aircraft to control the lift, and hence the vertical flight path, of the aircraft. The spoilers are servoed to cause the aircraft to fly at a constant altitude or to ascend or descend at a controlled rate. The invention is particularly useful in an automatic system for controlling the vertical profile of the approach path of an aircraft to an airport.

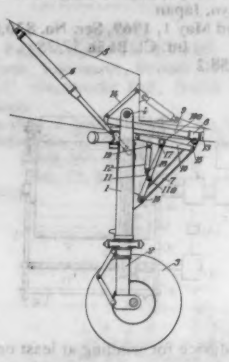
3,589,649

STRUTS FOR RETRACTABLE AIRCRAFT UNDERCARRIAGES

Jacques Leclercq, and Claude Victor, both of Saint-Leu-la-Foret, France, assignors to Societe National D'Etude Et De Construction De Moteurs D'Aviation, Paris, France

Filed Sept. 10, 1969, Ser. No. 856,561
Claims priority, application France, Sept. 10, 1968, 165708
Int. Cl. B64c *25/14*
U.S. Cl. 244—102 9 Claims

A retractable undercarriage strut for an aircraft tricycle undercarriage includes a bracing arm for ensuring the rigidity of the strut. A stay assembly of special construction and an extensible strutting element provides for efficient retractability and rigidity of the strut.

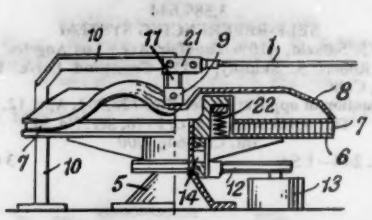


3,589,650

ARRESTING DEVICE FOR AIRCRAFT

Sixten Einar Carlsson; Lars-ake Erling Svensson, and Bjorn Sture Wiklund, all of Norrkoping, Sweden, assignors to Bolgs Fabriks Aktiebolag, Norrkoping, Sweden

Filed Mar. 5, 1969, Ser. No. 804,488
Claims priority, application Sweden, Mar. 7, 1969, 3001/68
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 3 Claims



An arresting device for the braking of aircraft or other vehicles by means of an arrester device embodying a cable, net etc., connected to braking means, and which means includes a brake that has a brake drum that is caused to rotate before and during contact of the cable or net with the airplane, the rotation means for the brake drum being power means such as one or more electric motors, the speed of the power means and hence the rotative speed of the drum being controlled to cause it to correspond to the approach speed of a plane to be arrested so that the jerk on the cable during the arresting operation will be minimized.

3,589,651

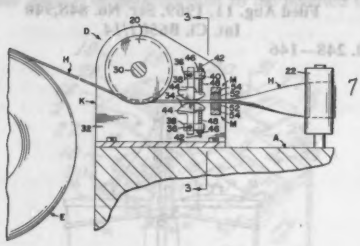
AIRCRAFT ARRESTING DEVICE

Ignatius John Niemkiewicz, Wilmington, Del.; Oscar Simeon Willey, Jr., Glen Mills, and Arthur Constantine Condodina, King Prussia, both of, Pa., assignors to Gulf & Western Industrial Products Company

Filed June 9, 1969, Ser. No. 831,445
Int. Cl. B64f *1/00*
U.S. Cl. 244—110 A 22 Claims

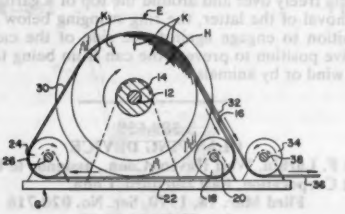
An aircraft arresting device includes a rotatable reel having drive means for rotating said reel to wind an elongated flat tape thereon in layer-by-layer convolutions. Drag means is provided in spaced relation to the reel for applying a dragging force to the tape during rewind thereof so that the

tape is placed in tension between the reel and the drag means. This winds the tape tightly on the reel and prevents



slippage between adjacent tape layers during arrestment of an aircraft.

3,589,652
AIRCRAFT ARRESTING DEVICE
Charles S. Thompson, Jr., Vincentown, N.J., assignor to Gulf & Western Industrial Products Company
Filed July 8, 1969, Ser. No. 839,878
Int. Cl. B64f *1/00*
U.S. Cl. 244—110 A **8 Claims**

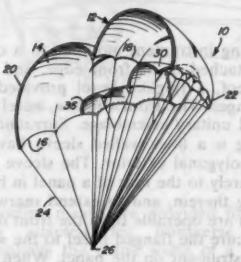


An aircraft arresting device includes a rotatable reel having an elongated flat tape coiled thereon in layer-by-layer convolutions. A concentrated compressive force is applied to the tape layers on the reel to prevent relative slippage between adjacent layers. The concentrated compressive force may be applied by the tape extending from the reel around a guide and back onto the reel for applying a compressive force when the free end of the tape is tensioned during arrestment of an aircraft.

3,589,653
STRESS-TAILORED GORES
Richard J. Slater, Northfield, Minn., assignor to G. T. Schjeldahl Company, Northfield, Minn.
Filed Apr. 1, 1969, Ser. No. 811,763
Int. Cl. B64d *17/02*
U.S. Cl. 244—145 **7 Claims**

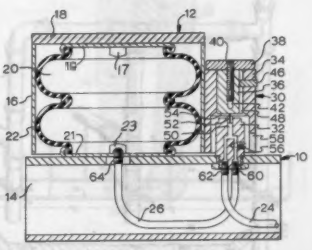
Stress-tailored gores for aerial decelerator devices such as parachutes, paragliders or the like comprising gores in the form of flexible reinforced structures. The gores forming the decelerator structure are made of either nonporous film or a woven porous fabric such as nylon or the like of the type normally employed for aerial decelerator devices. Reinforcing scrim or lines are secured to a surface of the gore structure with certain of the scrim axes being arranged generally oblique to the axis of the gore, and in addition, load lines or additional reinforcement is applied along an axis generally parallel to the axis of the particular segment of the gore at the point where the reinforcement is applied. Load or shroud lines are also provided which extend along the lateral edges of the individual gores with the free ends of these edge-mounted reinforcing lines being secured to a common load ring or load bearing member.

3,589,654
GLIDE CONTROL SYSTEM FOR CONTROLLED DESCENT PARACHUTE
Stephen L. Snyder, 331 Cherry Hill Blvd., Cherry Hill, N.J.
Filed Feb. 6, 1969, Ser. No. 797,020
Int. Cl. B64d *17/14*
U.S. Cl. 244—152 **12 Claims**



A glide-type of parachute canopy is provided with an airflow deflecting flap having an edge vertically displaceable intermediate the nose and trailing edge of the canopy to compensate for shift of the center of pressure tending to produce divergent stall when forward glide speed is being reduced by variation in the inflated shape of the canopy.

3,589,655
APPARATUS FOR ISOLATING VIBRATIONS
Herbert F. Hackbarth, Worthington, and Arthur E. Reams, Columbus, both of, Ohio, assignors to Consolidated Kinetics Corporation, Columbus, Ohio
Filed Mar. 10, 1969, Ser. No. 805,676
Int. Cl. F16f *15/00*
U.S. Cl. 248—20 **14 Claims**



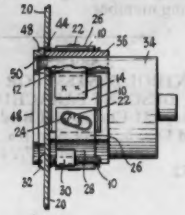
A vibration isolation system of the type that includes a load-supporting means isolated from a base means by a resilient air chamber means that is controlled at constant level by a novel air controller means. The apparatus is further characterized by the air controller including an air discharge port that continuously bleeds air from the system and an air-releasing member positioned in relatively movable and confronting relationship with said air discharge port so as to control the airflow bleed from the system in equilibrium with the load-supporting force exerted by the resilient air chamber means.

3,589,656

MOUNTING FOR PANEL-TYPE INSTRUMENTS

Donald E. Protzmann, Litchfield, Conn., assignor to Lewis Engineerving Company, Naugatuck, Conn.

Filed Dec. 1, 1969, Ser. No. 881,197
Int. Cl. G12b 9/00
U.S. Cl. 248—27 5 Claims



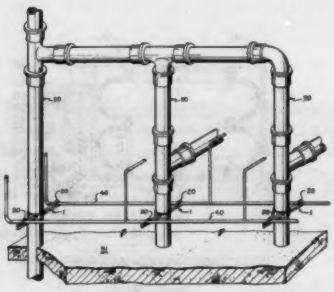
An indicating instrument mounted in a cylindrical casing which has attached to its front edge, and surrounding the window thereof, a ringlike bezel provided with apertured mounting flanges. The front window, bezel and casing constitute a rigid unitary assemblage. Surrounding and slidable on the casing is a thick-walled sleeve having a cylindrical bore and a polygonal exterior. The sleeve is adapted to be clamped securely to the rear of a panel in back of an instrument opening therein, and to extend rearwardly therefrom. Screws which are operable from the front of the instrument, releasably secure the flanged bezel to the sleeve, thereby to mount the instrument on the panel. When the front screws are removed, the bezel is free of the sleeve which surrounds the instrument casing, thereby enabling the instrument to be withdrawn forwardly of the panel for servicing. The sleeve has threaded holes to accommodate the screws, whereby the removal and replacement of the instrument can be done quickly and easily, completely from the front of the panel.

3,589,657

SUSPENDED CONDUIT SUPPORT BRACKET

Clyde M. Pendley, 1767 De Foor Ave. N.W., Atlanta, Ga.

Filed May 15, 1969, Ser. No. 824,870
Int. Cl. F16l 3/22
U.S. Cl. 248—68 7 Claims



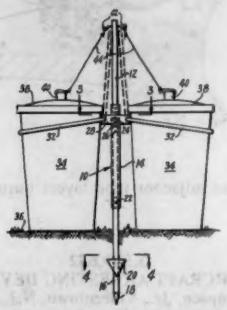
This invention relates to a support bracket for use in supporting, spacing and aligning suspended conduits in relation to a self-supported conduit. More particularly, this invention includes a support bracket having a first clamping means for fastening to a self-supported conduit and a second clamping means for fastening to a suspended conduit with laterally adjustable means in a selected one of a plurality of laterally spaced positions.

3,589,658

STABILIZER FOR GARBAGE CANS AND THE LIKE

Elmer L. Kopfman, 723 3rd St., and Richard L. Rhoades, 209 Parkhill St., both of Colusa, Calif.

Filed Aug. 11, 1969, Ser. No. 848,940
Int. Cl. B65f 1/14
U.S. Cl. 248—146 1 Claim



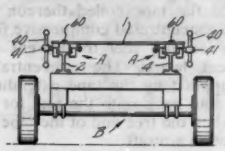
A support is mounted above the ground or other surface and may be attached either to a wall or to a vertical stake driven in the ground and has pivoted thereto one or more can-engaging rings of such diameter as to be free to swing upwardly freely over and around the top of a garbage can for the removal of the latter, the ring swinging below a horizontal position to engage against one side of the can when in operative position to prevent the can from being tipped over by the wind or by animals.

3,589,659

CLAMPING DEVICE

Robert F. Larkin, West Haven, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 18, 1970, Ser. No. 020,716
Int. Cl. B62d 23/00
U.S. Cl. 248—228 7 Claims



An equipment-supporting base adapted to be clamped to an elongated flanged beam has a hollow pad in the opposite sidewalls of which a hand-rotated shaft is journaled. The shaft has left-hand and right-hand threaded portions on opposite sides of the pad which carry threaded clamping members for engaging oppositely extending flanges on the beam. A spacer is fixed to the shaft within the hollow pad and the shaft carries compression springs between the spacer and the adjacent sidewalls of the pad which center the shaft and clamping member assembly relative to the pad prior to engagement of said clamping members with said flanges.

3,589,660

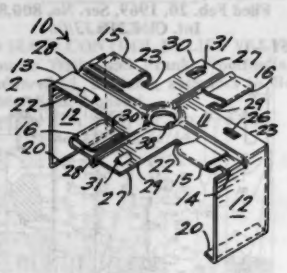
LIGHTING FIXTURE HANGER

Bruce P. Dunckel, Stone Mountain, Ga., assignor to National Service Industries, Inc.

Continuation of application Ser. No. 799,131, Dec. 16, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 740,557, June 27, 1968, now abandoned. This application Mar. 5, 1970, Ser. No. 16,768
Int. Cl. F16b 1/00
U.S. Cl. 248—343 14 Claims

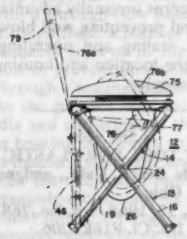
A device for hanging lighting fixtures below a dropped ceiling from inverted tees which support the dropped ceiling. A pair of wing portions depend from a body portion of the

device for lockably engaging the lighting fixture. One or two pairs of clips extend above the body portion for selectively attaching the device to an inverted tee such that the fixture hangs either parallel or perpendicular to the inverted tee. In



another embodiment, the device is attached to an inverted tee with a pair of clips on a bracket which is pivotally mounted to the body portion of the device such that a lighting fixture can be hung at any angle to the inverted tee.

3,589,661
HUNTER'S STOOL WITH REVOLVING SEAT
Garrett H. Harris, 157 S. Denver St., Jackson, Miss.
Filed Sept. 23, 1968, Ser. No. 761,455
Int. Cl. F16m *11/38*
U.S. Cl. 248—432 **7 Claims**

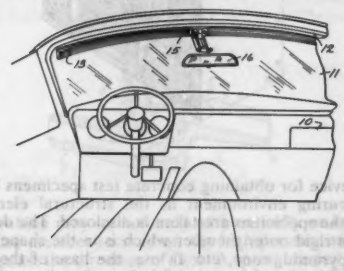


A hunter's stool having pivoted U-shaped frame members, a flexible web linking crossbar portions of the frame members, there being an opening in the web, a bag attached to the web in communication with the opening, a frame board releasably mounted on the crossbar portions for closing and covering the opening when in open position, and a seat rotatably mounted on the frame board.

3,589,662
SAFETY REARVIEW MIRROR MOUNTINGS
Henri Lagrange, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France
Filed Dec. 24, 1968, Ser. No. 786,661
Claims priority, application France, Jan. 23, 1968, 137,073
Int. Cl. B60r *1/04*
U.S. Cl. 248—475 **3 Claims**

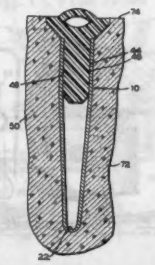
A fastening device applicable more particularly to rearview mirrors of automotive vehicles, characterized in that it comprises two members, one of relatively rigid material and the other of resilient material, which are secured the one to the rearview mirror arm and the other to the vehicle body, said members comprising elements permitting their mutual engagement by flexion of said resilient member and their disengagement when a certain force or a shock is applied to the member carrying the rearview mirror.

3,589,663
MOUNTING FOR ADJUSTABLE REARVIEW MIRROR ASSEMBLY FOR VEHICLES
Charles M. Vance, P.O. box 8155, Atlanta, Ga.
Filed Oct. 25, 1968, Ser. No. 770,697
Int. Cl. B60r *1/04*
U.S. Cl. 248—480 **6 Claims**



Improved supporting means are provided for a rearview mirror assembly adapted for transverse adjustment throughout substantially the entire width of a vehicle. The improved supporting means comprise a slotted elongated bar which can be affixed by means of an adhesive strip to extend across the top of the windshield of the vehicle. Improved means are also provided for fixing the position of the guide element to which the rearview mirror is attached in the desired position along the slotted elongated bar.

3,589,664
REUSABLE STRUCTURE FOR FORMING JOINTS IN CONCRETE
William F. Middlestadt, Rte. 2, Box 330, Arnold, Md.
Filed Jan. 11, 1968, Ser. No. 697,063
Int. Cl. E01c *11/04*
U.S. Cl. 249—9 **3 Claims**



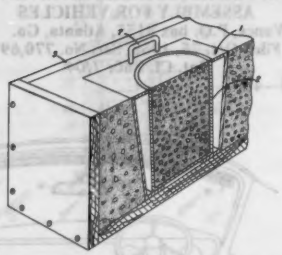
A two-part groove-molding structure for forming a joint in a freshly poured concrete roadway or the like; one part being a metallic U-shaped envelope having an open top and a bottom bight portion of less cross-sectional thickness than the sidewalls and hingedly connecting such walls so that they tend to collapse together; the other part being a flexible wedge inserted within the envelope and gripped by knurled inner surfaces on the upper portions of the sidewalls, the wedge having an enlarged head laterally overlying the sidewalls and producing chamfered edges on the walls of the groove and the head having a bulged top for indicating proper placement of the structure in the concrete.

3,589,665

DEVICE FOR TESTING CONCRETE

David A. Onesti, and Glen F. Benedict, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 30, 1969, Ser. No. 795,320
Int. Cl. B28b 7/10; E04b 1/16
U.S. Cl. 249—139 1 Claim



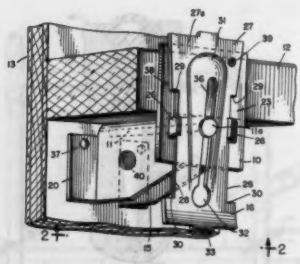
A device for obtaining concrete test specimens having the same curing environment as the structural element from which the specimens are taken is disclosed. The device comprises a rigid outer member which is in the shape of a truncated pyramid, cone, etc. In use, the base of the truncated member is placed in a pouring form for the structural element. A cylindrical paper test mold is inserted within a hole in the top of the truncated member. Liquid concrete is poured into the form and the test specimen mold is filled. The concrete is set and cured for a desired time. The truncated member and test specimen are removed from the structural element and the test specimen is subjected to conventional tests after removal from the outer member. The hole left in the structural element is readily patched because of the converging sides thereof.

3,589,666

CLAMP FOR USE WITH CONCRETE FORMS

Richard J. Kirby, 2901 S. Michigan Ave., Chicago, Ill.

Filed Dec. 16, 1968, Ser. No. 784,125
Int. Cl. E04g 17/06
U.S. Cl. 249—219 3 Claims



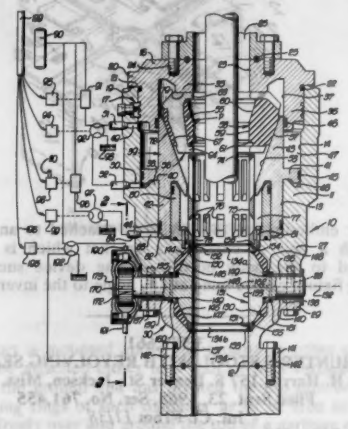
An improved clamp for use in joining reinforcing beams and concrete forms having tie rods therethrough. The clamp includes a generally channel-shaped body having a web portion and a pair of depending sidewalls. A front plate extends transversely between the front ends of the sidewalls and extends upwardly above the web portion for holding the reinforcing beam against the concrete form. The front plate is provided with an opening therethrough adjacent to and below the web portion for receiving the end of a tie rod, and a pair of retainer flanges on the front plate slidably receive a slide plate. The slide plate includes an inclined, raised central portion which is provided with a longitudinally extending slot terminating in an opening for receiving the end of a tie rod.

3,589,667

COMBINATION WELL BLOWOUT PREVENTER

George E. Lewis, Arcadia, and Fernando Murman, Palos Verdes Peninsula, both of, Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed Feb. 20, 1969, Ser. No. 800,850
Int. Cl. E21b 33/06
U.S. Cl. 251—1 10 Claims



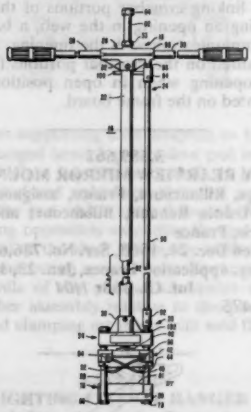
The disclosure concerns unusually advantageous apparatus used in controlling and preventing well blowouts, and utilizing novel plug-valve sealing and operating structure, and further as related to the location and housing of an inwardly constrictable packer annulus.

3,589,668

SHUTOFF TOOL FOR PLASTIC PIPE

John B. Gill, Redondo Beach, Calif., assignor to Sanford E. Coblitz, Ashtabula, Ohio

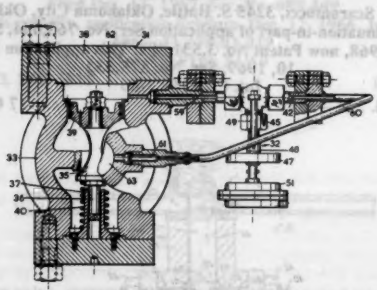
Filed Oct. 17, 1968, Ser. No. 768,235
Int. Cl. F16k 7/06
U.S. Cl. 251—8 7 Claims



A pipe shutoff tool, operable from above the surface of the ground, for squeezing closed a section of plastic pipe located below ground level. The tool includes a handle assembly coupled to a closure assembly so that opposingly mounted die members carried on the closure assembly may be moved into and out of engagement by jack means operable from the handle assembly. A die-positioning linkage extends from the handle assembly to one of the die members and is operable to rotate one of the die member between a first position, associated with squeezing shut the pipe, and a second position

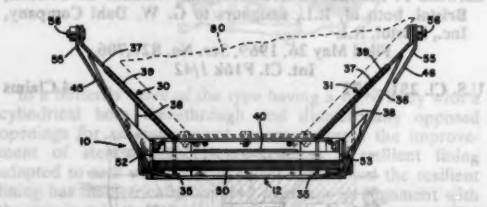
associated with mounting the tool onto the pipe. The tool further comprises separate spring devices centered on opposite faces of one die member for laterally and axially centering the tool on the pipe.

3,589,669
FLUID FLOW CONTROL RELIEF VALVE
Graham Melbourne Wells, and Frank Woolfindin, both of Fartown, Huddersfield, England, assignors to Hopkinsons Limited, Huddersfield, England
Filed Nov. 25, 1968, Ser. No. 778,682
Int. Cl. F16k *31/145*
U.S. Cl. 251—25 6 Claims



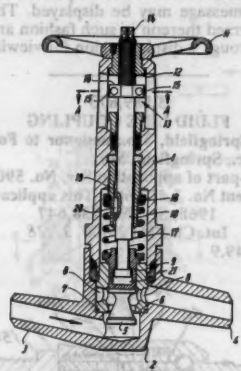
A relief valve for use as a pilot valve especially but not exclusively in a pump relief valve arrangement and comprising a valve casing with a through-flow passage therethrough for passage of a controlled fluid, a parallel slide valve housed in the casing and slidable relative to the passage to open or close same to allow or prevent flow of the controlled fluid, a spindle passing through a sealing means into the valve casing and connected to the parallel slide valve, and a device for loading the spindle and consequently the parallel slide valve and comprising a housing connected to the valve casing and enclosing a fluid-loaded diaphragm and piston assembly, a piston rod between the diaphragm and piston assembly and the spindle to transmit movements of the assembly to the spindle, and an inlet in the housing for the loading fluid at that side of the housing remote from the valve casing.

3,589,670
GATE VALVE
George W. Armstrong, 284 E. Dayton Drive, Fairborn, Ohio
Filed Dec. 15, 1969, Ser. No. 884,936
Int. Cl. F16k *31/00, 1/16*
U.S. Cl. 251—58 9 Claims



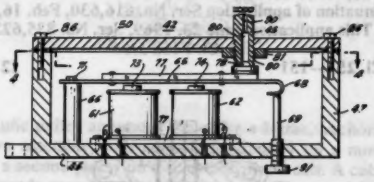
A low-profile valve employs a swinging gate type of blade and is particularly adapted for use in installations where the valve height must be maintained to a minimum or where it is desirable to place the valve immediately beneath a hopper, a screw conveyor outlet or the like. The valve body is formed of sections of channel-shaped material in which the upper and lower channel flanges form the valve-mounting flanges and in which the central web of the channels form the valve throat. The curved blade extends through a slot in one of the channels and is supported on a pair of outwardly angulated blade arms. Blade arm supports comprise a pair of correspondingly outwardly angulated support members so that the support members and the arms define a relatively wide clearance space therebetween to receive a hopper or the like.

3,589,671
VALVE
Wilhelm Strache, Bremen, Germany, assignor to Gustav F. Gerdts K.G., Bremen, Germany
Filed Oct. 21, 1969, Ser. No. 868,125
Int. Cl. F16k *31/44, 47/02*
U.S. Cl. 251—83 4 Claims



A valve which may be actuated automatically or by hand has a closure member located on the high-pressure side and opening against the direction of flow. A spring carried by the valve spindle is used to open the closure member. The tension of the spring may be varied by a threaded bush serving as a spring support and helically movable in the valve casing. The valve is particularly characterized in that the valve spindle carries the spring-engaged closure member with axial play which is freely suspended therefrom. The spindle carries a turn lock which can be released. A driver connection operable only in direction of rotation is provided between a spring support mounted in the valve casing and helically adjustable relatively thereto and the valve spindle. Thus when the turn lock is released, the spring support can be adjusted by turning the valve spindle.

3,589,672
SOLENOID CONTROLLED VALVE AND ARMATURE WITH ADJUSTABLE BIAS
Charles J. Haolloman, Stamford, Conn., assignor to Trans-lux Corporation, New York, N.Y.
Division of Ser. No. 600,900, Dec. 12, 1966, Pat. No. 3,482,344.
This application Feb. 18, 1969, Ser. No. 834,568
Int. Cl. F16k *31/06*
U.S. Cl. 251—129 3 Claims



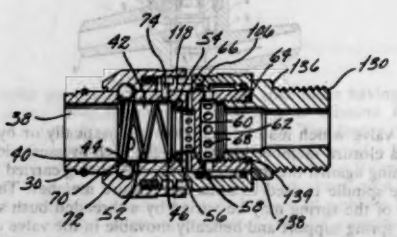
The invention comprises a plurality of interconnected panel elements each having a plurality of generally flat bistable display members arranged thereon in a series of rows and columns. Each display member has one surface which is substantially nonreflecting and generally light absorbing. The opposite surface of each display member is bright or, in many instances, is coated with a fluorescent or a luminescent material particularly adapted for excitation by ultraviolet light to bring it to a highly luminous state for display purposes. A plurality of magnetically operated signal-controlled fluid jets is positioned adjacent to the panel and so located as to be capable of moving selected ones of the bistable display members between the two bistable positions for display. The

display members are preferably arranged so that for clearance a complete column of display members can be simultaneously changed to one of the two different positions of stability which may be regarded as a datum state. Following each control of the display column with all display members similarly oriented the next adjacent column may be similarly controlled, and so on. After all display members of the display panel are in like position selective ones of the group may be oriented to the second position so that by relative contrast a message may be displayed. The panels with the messages formed thereon in such fashion are then successively moved through a display region for viewing.

3,589,673
FLUID LINE COUPLING

Lee H. Cruse, Springfield, Mo., assignor to Foster Manufacturing Co., Inc., Springfield, Mo.

Continuation-in-part of application Ser. No. 590,721, Oct. 31, 1966, now Patent No. 3,477,688. This application June 20, 1968, Ser. No. 738,647
Int. Cl. F16l 29/00, 37/28
U.S. Cl. 251—149.9 **3 Claims**

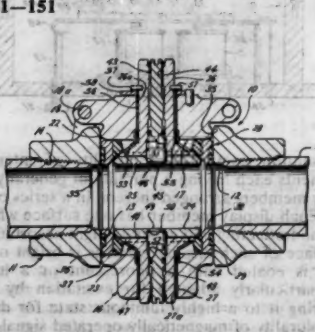


A quick-connect coupling for fluid line hose couplings includes a body portion adapted to receive a conventional male hose coupler element. The coupling has two axially aligned sleeves mounted on the exterior. The latching sleeve actuates the mechanism which engages the male coupler element while the valve sleeve is part of the valve means for blocking the flow of fluid through the female coupling. The valve sleeve has a bayonet slot which receives a radially projecting pin on the body, optionally locking the valve sleeve in an open position. It then abuts against the latching sleeve and prevents the latter from moving to the unlocked or disengaged position with respect to the male coupler. Between the latching and valve sleeves is a spring biasing the latching sleeve toward the engaged position and urging the valve sleeve to and maintaining it in the closed position when it is not positively locked in the open position.

3,589,674
VALVES

Marvin R. Jones, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Continuation of application Ser. No. 616,630, Feb. 16, 1967. This application June 23, 1969, Ser. No. 835,622
Int. Cl. F16k 5/06
U.S. Cl. 251—151 **12 Claims**

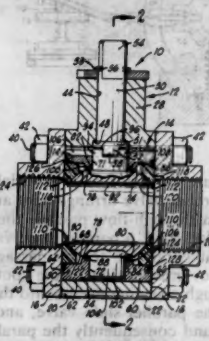


A valve comprising a first body connectable as a relatively permanent part of a conduit with its flowway forming a continuation of the conduit, and a second body removably held by a readily releasable and non-load-carrying member within an opening in the first body which extends laterally across the flowway. An opening through the second body extends concentrically of the flowway, and a closure member is supported by the second body within the opening for opening and closing the flowway. Seats are carried within the second body opening on opposite sides of the closure member to seal with the sides of the first body opening, the second body opening and the closure member when in flowway-closing position.

3,589,675
ROTARY VALVE ASSEMBLY WITH INSERTABLE VALVE UNIT

Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla.

Continuation-in-part of application Ser. No. 763,644, Sept. 30, 1968, now Patent No. 3,531,081. This application Nov. 10, 1969, Ser. No. 875,332
Int. Cl. F16k 5/06
U.S. Cl. 251—151 **17 Claims**

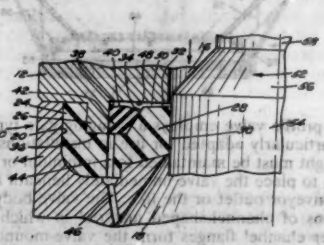


An improved valve assembly for use between flanges basically comprising a valve unit and a housing unit. The valve unit is sized to slidingly fit lengthwise into the housing unit, and includes a slot in a portion of the outer periphery thereof to accommodate the inner end of a valve stem mounted in the housing unit, such that the housing unit valve stem need not be moved lengthwise when the valve unit is being replaced. The housing unit is adapted to cooperate with the flanges to provide a circumferential, secondary metal-to-metal seal therebetween.

3,589,676
VALVE SEAL

Linwood P. Erickson, Barrington, and Williams G. Getchell, Bristol, both of, R.I., assignors to G. W. Dahl Company, Inc., Bristol, R.I.

Filed May 26, 1969, Ser. No. 827,706
Int. Cl. F16k 1/42
U.S. Cl. 251—172 **4 Claims**



A seal of particular utility in connection with reducing valves operating under extremely high pressures, said seal comprising an annular deformable member that cooperates with a valve plug to block passage through a bore, said seal having an annular recess on its upstream surface, which

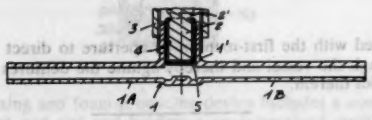
recess has therein a deformable ring, means for permitting communication between said bore and said recess; whereby when said plug is in closed position, pressure in the system will be diverted via said means to said recess to deform said ring, said deformation forcing the seal radially inward to further increase pressure between the seal and the plug, and venting means extending through said seal in communication with said recess and communicating with said bore downstream of said seal.

3,589,677

PISTON VALVE

Henri Segers, 277, rue du Velodrome, Rettine, (Liege), Belgium

Filed Dec. 11, 1967, Ser. No. 689,449
Claims priority, application Belgium, Dec. 12, 1966, Jan. 23, 1967, 41,176;41,218
Int. Cl. F16k *31/50*
U.S. Cl. 251—215 1 Claim



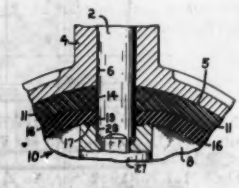
Piston valve, more particularly made of glass and synthetic material, comprising a cylindrical or slightly conical body flaring in the downward direction, provided with arms and in which there is mounted a piston constituted by a rigid core covered with a compressible flexible material, the latter being itself covered with a thin rigid material acting as a lubricant.

3,589,678

BUTTERFLY VALVE WITH IMPROVED STEM SEALING MEANS

Fred L. Magoon, Oklahoma City, Okla., assignor to Demco, Incorporated, Oklahoma City, Okla.

Filed Feb. 4, 1970, Ser. No. 8,477
Int. Cl. F16k *1/22*
U.S. Cl. 251—306 11 Claims



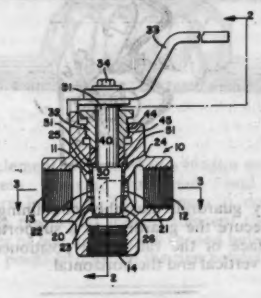
In a butterfly valve of the type having a valve body with a cylindrical bore therethrough and diametrically opposed openings for receiving pivot means, wherein the improvement of stem-sealing means includes a resilient lining adapted to seat within the cylindrical bore and the resilient lining has diametrically opposed openings in alignment with the openings in the valve body and diametrically opposed flat surfaces each having said respective opening centered therein. A substantially rigid butterfly disc is positioned on the diameter passing through the aligned openings and has a rim dimension greater than the interior dimension of the resilient lining and the disc has diametrically opposed flattened surfaces on the rim of the disc, with the flattened surfaces being normal to the diameter passing through the aligned openings in the resilient lining and having a recess in the flattened surfaces to form lands for engagement with and deflection of the respective flat surface of the resilient lining, to effect an uninterrupted line of sealing engagement between the disc and the resilient lining when the disc is moved to a closed position.

3,589,679

PLUG VALVE

John R. Birk, Dayton, Ohio, assignor to The Duriron Company, Inc., Dayton, Ohio

Filed Nov. 28, 1969, Ser. No. 880,834
Int. Cl. F16k *5/02*
U.S. Cl. 251—317 10 Claims



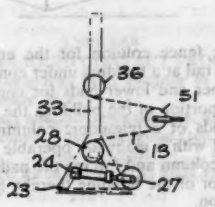
A rotary plug valve for corrosion-resistant service includes a body bore and a plug and is provided with a deformable bushing of filled fluorocarbon resin surrounding the plug stem and having a lower beveled end engaging in sealing relationship a fluorocarbon sleeve positioned in the valve bore and the top of the plug. Axially extending grooves are formed in the valve bore and portions of the bushing are forced into the grooves to prevent rotation of the bushing after assembly of the valve.

3,589,680

HYDRAULIC PULLEY APPARATUS

Charles Joseph Kuhn, 10520 Plainview Ave., Tujunga, Calif.

Filed June 20, 1968, Ser. No. 738,450
Int. Cl. B66d *3/08*
U.S. Cl. 254—189 5 Claims

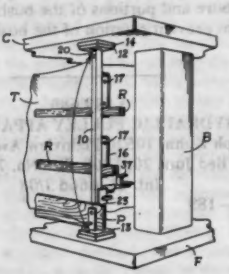


Hydraulic pulley apparatus including a frame, anchored to a tiedown assembly, supporting a first pulley on a movable axis and a second pulley on a selectably fixed axis. A cable or chain extends over the first and second pulleys and is connected at one end to the frame, with the other end being attached to a workpiece. The pulleys are arranged in such a manner that movement of the first pulley away from the second pulley draws the end of the chain attached to the workpiece toward the second pulley. The movement of the first pulley is accomplished by selectively operable and controllable hydraulic power means. A third pulley may be mounted on the frame at various positions above the first and second pulleys for receiving the end of the chain attached to the workpiece, and maintaining the chain at various attitudes. Locking means hold the chain under tension to permit release of the hydraulic power means for sequential operation thereof.

3,589,681
GUARDRAIL ASSEMBLY
Thomas G. Ackerman, Hellertown, Pa., assignor to Bethlehem Steel Corporation
Continuation of application Ser. No. 781,334, Dec. 5, 1968, now abandoned. This application May 11, 1970, Ser. No. 37,402
Int. Cl. E01f 15/00
U.S. Cl. 256—13.1 1 Claim

A highway guardrail assembly containing an adjustable bracket to secure the guardrail to a supporting post and to permit the face of the rail to be positioned at any angle between the vertical and the horizontal.

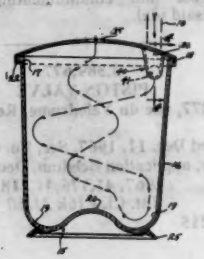
3,589,682
SAFETY FENCE SUPPORT COLUMN
Edward Earl Dickey, R. R. #6, Brampton, Ontario, Canada
Filed July 28, 1969, Ser. No. 845,132
Claims priority, application Canada, Nov. 30, 1968, 036,586
Int. Cl. E04h 17/18
U.S. Cl. 256—59 6 Claims



A telescopic fence column for the erection of a safety fence or guard rail at a building under construction which incorporates upper and lower pads for contacting the ceiling and floor of a portion of the building, the pads being located at opposite ends of a telescopic column, and the column being provided with a manually operable jacking system for extending the column and forcing the pads firmly against the ceiling and floor of the building thereby holding the column firmly in position.

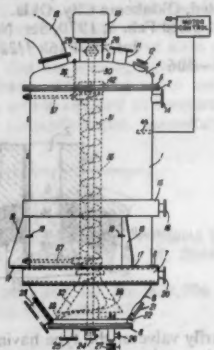
3,589,683
VESSEL AND CLOSURE FOR HYDRAULIC AGITATION OF DENTURES AND THE LIKE
Peter G. Robin, 618 Lincoln Blvd. Apt. B, Santa Monica, Calif.
Filed Aug. 28, 1969, Ser. No. 853,819
Int. Cl. B01f 5/10
U.S. Cl. 259—4 10 Claims

A vessel having a removable closure that is apertured for the reception of a stream of fluid and for the discharge thereof, and provided with means to direct the fluid for efficient agitation of articles contained in the vessel. This invention is particularly useful in the care of dentures that require thorough cleansing and rinsing in scalding water, and comprises a lightweight insulating vessel with means for attachment to the smooth interior surface of a porcelain or similar basin. The closure is characterized by a marginal aperture therein that permits the jetting of fluid from a faucet so as to enter the vessel, and by a central aperture for discharge of fluid after it is spent to agitate the articles contained in the vessel, the first-mentioned means being a nozzle



aligned with the first-mentioned aperture to direct the fluid through the vessel and thereby agitate the dentures or other articles therein.

3,589,684
MALTING APPARATUS
Bernard Dixon, Harpenden, England, assignor to The Dixon Malt Company Limited and The Enzymic Malt Company Limited, London, England
Filed May 31, 1968, Ser. No. 733,641
Claims priority, application Great Britain, June 1, 1967, 25,457/67
Int. Cl. B01f 5/12
U.S. Cl. 259—97 16 Claims



A malting vessel has a vertical tube set within it, with its ends spaced from the top and bottom of the vessel, and there is a feed screw or a gas stream active in the tube so that a circulation of contents may be set up throughout the vessel, at will. Air or other gas at controlled temperature, humidity and pressure can be injected into the vessel at any time. When a feed screw is used it preferably has a special construction, with a conically flared lower end, the pitch of the screw in this region being progressively inversely proportional to its diameter.

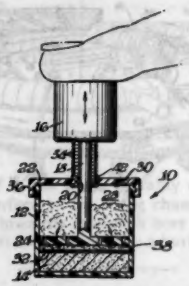
A novel method of malting involves the setting up of a circulation of grain in a vessel in such a way that part of the grain batch is rising while another part is falling, gas being optionally injected at least into the part of the circulation where grain is falling.

3,589,685

MIXING AND FOAM-PRODUCING DEVICE

Frederick John Gradishar, 1218 Evergreen Road, Carrcroft Crest, Wilmington, Del.

Filed Feb. 6, 1969, Ser. No. 797,206
Int. Cl. B01f 13/00
U.S. Cl. 259—124 11 Claims



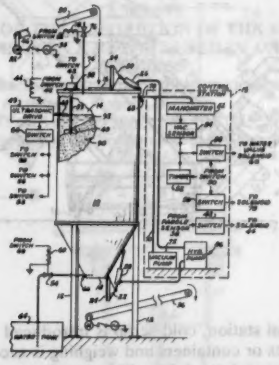
A mixing and foam-producing device includes a container closed at one end and holding a predetermined quantity of foam-producing agent therein. A removable cover closes the other end of the container to define a closed chamber of predetermined quantity. Extending through the cover is a rod with a piston attached thereto for intermittently moving toward and away from the foam-producing agent whereby a liquid which is placed in the chamber mixes with air and foam-producing agent to create a foam. Indicating means are also provided to control the relationship between the volumes of liquid and air in the chamber.

3,589,686

AGGREGATE TREATMENT PROCESS AND APPARATUS

Thomas O. Russell, Jr., Fullerton, Calif., assignor to The Susquehanna Corporation, Fairfax County, Va.

Filed Mar. 16, 1970, Ser. No. 19,863
Int. Cl. B28c 7/00
U.S. Cl. 259—148 15 Claims



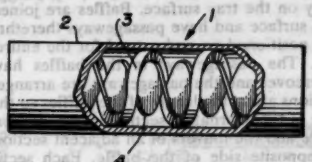
The process is directed to the vacuum-saturation of porous lightweight aggregate in which a high vacuum is first drawn on the aggregate to evacuate the aggregate voids, and then the aggregate is flooded with water to fill the evacuated voids and thereby saturate the aggregate. The desired vacuum level is preset, and no water can enter the saturation chamber until this level is reached. Also, if the vacuum drops below this level while water is being admitted, the process is stopped until the vacuum level is again attained.

3,589,687

PACKING ELEMENT

Allen E. Leybourne III, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1968, Ser. No. 786,110
Int. Cl. B01f 3/02, 3/04, 3/08
U.S. Cl. 261—79 7 Claims



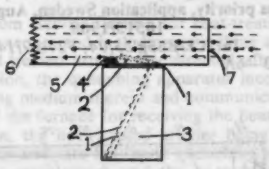
A packing element to be used in a reactor or mass transfer device wherein gas-gas, gas-liquid, and liquid-liquid phenomena are involved. The element is comprised of a housing having positioned therein adjacent the walls a first helical member of one hand, and a second helical member of opposite hand positioned within the first helical member.

3,589,688

SUPPLY VAPOR TO THE CARBURETOR, FOR INTERNAL COMBUSTION MOTORS

Frank B. Ottofy, 2036 McCausland Ave., St. Louis, Mo.

Filed July 12, 1968, Ser. No. 744,556
Int. Cl. F02m 25/02
U.S. Cl. 261—99 1 Claim



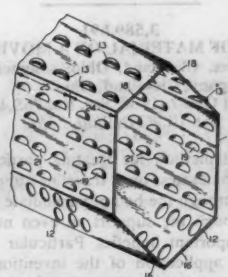
A wick, inserted into a container of water, so arranged that the wick enters the bottom of the duct into the air filter, wick resting in a trough so constructed that the sides and rear of the trough are raised to restrict the suction of water into the carburetor of an internal combustion motor.

3,589,689

VAPOR-LIQUID CONTACT PROCESS

John C. English, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 498,790, Oct. 20, 1965, now abandoned. This application Oct. 28, 1968, Ser. No. 777,969
Int. Cl. B01d 3/18, 3/28; B01f 3/04
U.S. Cl. 261—114 1 Claim



A tray for use in vapor-liquid contacting columns in which the vapor flows upwardly through orifices in the tray and liquid flows downwardly through the column. The tray com-

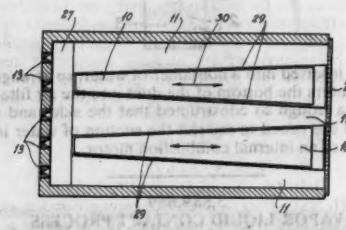
prises a corrugated surface having spaced ridges running the length of the tray. The corrugated surfaces having a multiplicity of orifices therethrough for vapor flow upwardly through the tray and the orifices are arranged in spaced groups separated from the next adjoining group of orifices by a portion of the tray which does not contain any orifices. A liquid downcomer receives liquid on one section of the tray and another liquid downcomer discharges liquid from another section of the tray, whereby liquid is caused to flow horizontally on the tray surface. Baffles are joined with the corrugated surface and have passageways therethrough. The baffles are positioned on and extend for the entire length of the ridges. The passageways in the baffles have louvers formed thereover and the passageways are arranged in alternating sections along the length of the baffles so that the louvers of one of the alternating sections protrude from one side of the baffle and the louvers of an adjacent section protrude from the opposite side of the baffle. Each section of the passageways are coextensive with a group of orifices in the tray are positioned so that the orifices in the tray are on the side of the baffle corresponding to the outlet-side of the louvered opening in that section. The baffle has thereon a continuous path for liquid flow along the baffle surface to the corrugated tray. A perforated cover joins the baffles. The cover extends from each baffle and joins adjacent baffles to form a multiplicity of parallel, tunnel-shaped enclosures. The cover has thereon a continuous path joining with the continuous path of the baffle for the liquid flow along the surfaces of the cover and baffle to the corrugated surface.

3,589,690

WALKING BEAM FURNACES

John Erland Erixson, Vasteras, Sweden, assignor to Svenska Metallverkens Ugns Aktiebolag, Vasteras, Sweden

Filed Aug. 1, 1969, Ser. No. 846,870
Claims priority, application Sweden, Aug. 2, 1968, 10515/1968
Int. Cl. B65g *25/04*; F27b *9/14*
U.S. Cl. 263—6A 2 Claims



An arrangement in walking beam furnaces of the type having at least one walking beam which extends substantially in the feed direction of the furnace, and stationary supporting beams arranged adjacent to each walking beam, on both sides thereof, wherein the long sides of each walking beam in at least certain portions of the furnace form an angle with the feed direction of the walking beam.

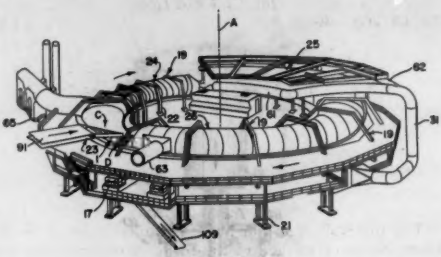
3,589,691

TREATMENT OF MATERIAL ON A MOVING SUPPORT

Melvin J. Greaves, Cleveland, Ohio, assignor to Arthur G. McKee & Company, Cleveland, Ohio

Filed Oct. 7, 1968, Ser. No. 765,455
Int. Cl. F27b *9/00*, *21/02*
U.S. Cl. 263—28 28 Claims

Apparatus and method for treating particulate material, such as ore agglomerates, on a traveling support by treating gases that pass through the bed of particulate material on the support and through the support an even number of times that provides important benefits. Particular advantages are provided in the application of the invention to a circular grate in which a permeable grate travels in a circular path through various treating zones in which treating gases are passed through the grate and bed of particulate material on the grate, since higher pressure gases can bed used on only one side of the grate. This makes possible the use of a high-pressure resistant grate seal, such as a liquid seal, on only such side of the grate and lower pressure resistant seal on the other side of the grate. This method is inherently more thermally efficient than conventional methods used for pelletizing iron ore and solves the problem of inadequate cooling that is troubling many plants now in operation.

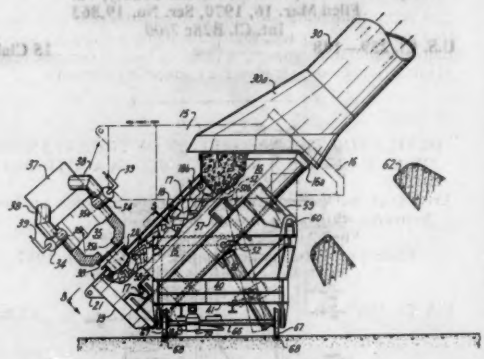


3,589,692

HOT SCRAP CHARGING

Ira W. Lakin, Volant, Pa., assignor to Pennsylvania Engineering Corporation, New Castle, Pa.

Filed Aug. 13, 1968, Ser. No. 752,327
Int. Cl. F27b *3/06*
U.S. Cl. 263—40 13 Claims



At an initial station, cold scrap is introduced into a group of scrap boxes or containers and weighing is accomplished to assure charges of desired sizes. The containers or scrap boxes are, during the charging, positioned on an inclined plane and are carried or hoisted in such an angular relation and placed in such a relation on a charging machine or car. The charging machine is movable along a charging floor between the furnaces and a preheating station for the scrap material. Metal scrap is preheated in the boxes or containers while they are positioned on the charging machine or car; the car is then moved into alignment with one of the furnaces for introducing preheated scrap thereto by pivoting one of the boxes into a reverse angular relation.

3,589,693

KILN STRUCTURE

Eberhard Wolf, Ibbenburen, Germany, assignor to Keller Ofenbau GmbH, Laggenbeck, Germany

Filed Sept. 16, 1969, Ser. No. 858,395
Claims priority, application Germany, Sept. 18, 1968, P 17 83 012.5
Int. Cl. F27d 1/00
U.S. Cl. 263—46 3 Claims

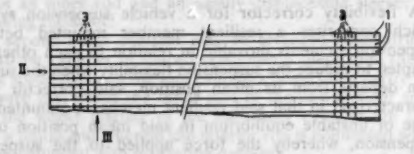
The top wall of a kiln has a plurality of bores extending from the outer surface to the firing chamber in the kiln. A shoulder projects inwardly into each bore adjacent the firing chamber to support a closure and/or a burner.

3,589,694

SUPPORTING PLATE FOR OBJECTS TO BE SUBJECTED TO A THERMAL TREATMENT

Henderikus Gelling; Wilhelmus Henricus Antonius Meulendijks, and Theodorus Gerhardus Wilhelmus Stijntjes, all of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,330
Int. Cl. F27d 5/00
U.S. Cl. 263—47 12 Claims



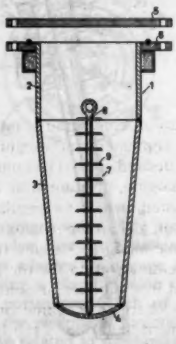
A supporting plate for objects to be subjected to a thermal treatment in a furnace, said plate being formed by substantially parallel thin supporting tubes or bars of ceramic material interconnected by transverse connecting elements.

3,589,695

DEVICE FOR THE ABSORPTION OF THE EXPANSION OF A CHARGE IN A RETORT USED IN A NITRIDING PROCESS

Arne Ivar Backstrom, Avesta, Sweden, assignor to Avesta Jernverks Aktiebolag, Avesta, Sweden

Filed Aug. 26, 1968, Ser. No. 755,219
Claims priority, application Sweden, Sept. 11, 1967, 12495/67
Int. Cl. C23c 11/14
U.S. Cl. 266—2 R 8 Claims



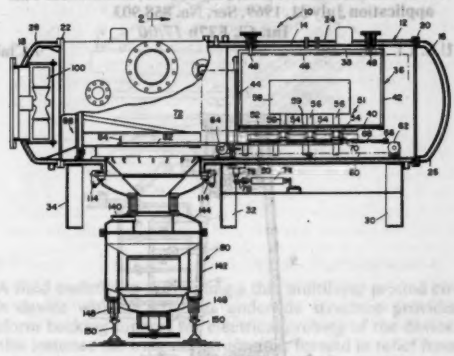
A nitriding retort containing a means which forms pockets to absorb expansion of the nitrided material during the nitriding process.

3,589,696

HIGH VACUUM ELECTRIC FURNACE WITH LIQUID QUENCH APPARATUS

Herbert W. Westeren, Barrington, and William H. Kimball, Providence, both of, R.I., assignors to C. I. Hayes Inc., Cranston, R.I.

Filed Mar. 4, 1968, Ser. No. 710,086
Int. Cl. C21d 1/66
U.S. Cl. 266—4 A 7 Claims



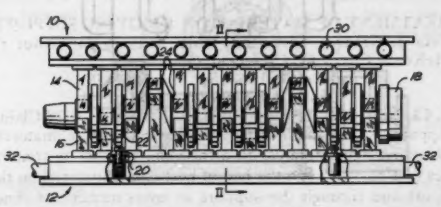
A high vacuum electric furnace for heat-treating metallic articles under vacuum and including quenching apparatus to which the heat-treated articles are directed after the heat-treating operation, the quenching apparatus incorporating a liquid quenching medium therein and communicating with a cooling area of the furnace for receiving the heat-treated articles therefrom, the heat-treated articles being discharged from the cooling area into the liquid quenching medium in a subatmospheric environment and the quenching apparatus being constructed and arranged for preventing vapors escaping from the quenching medium into the furnace cooling area and heating chamber.

3,589,697

DIE-QUENCHED CRANKSHAFT

Raymond H. Hays, Peoria; Jack E. Sansom, Eureka, and Kenneth D. Gladden, Washington, all of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 553,142, May 26, 1966, Pat. No. 3,506,501.
Divided and this application Nov. 5, 1969, Ser. No. 871,169
Int. Cl. C21d 1/62
U.S. Cl. 266—6 4 Claims



A die-quenching apparatus having relatively movable upper and lower opposed platens with a plurality of opposed workpiece-engaging die blocks attached to said platens and a plurality of protruding pads circumferentially located at

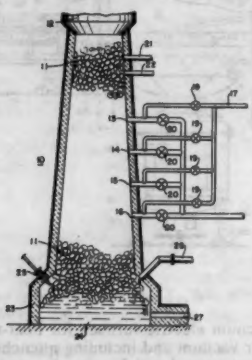
spaced intervals about the inner surface of each of said opposing die blocks. The opposed platens have internal cavities for the transmission of quenching fluid to the workpiece and said die blocks and pads are passageways extending therethrough and providing fluid communication between said platen cavities and said workpiece.

3,589,698

DIRECT GASEOUS REDUCTION OF IRON OXIDE

John Happel, 69 Tompkins Ave., Hastings-on-Hudson, N.Y., and Joachim Hillard Blanck, 260-16 69th Ave., Glen Oaks, N.Y.

Division of Ser. No. 468,864, July 1, 1965, abandoned. This application July 31, 1969, Ser. No. 858,903
Int. Cl. F27b *17/00*
U.S. Cl. 266—29 7 Claims



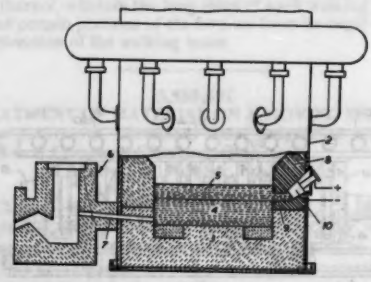
Apparatus for the direct gaseous reduction of molten iron from iron ore comprising a vertical shaft furnace having means for supplying gaseous mixtures of CO and H_2 to specified portions of said furnace, means to adjust the gaseous mixture of CO and H_2, a melting hearth connected to the outlet of said furnace having means for withdrawing exhaust gas from the hearth, and means for preventing said exhaust gas from entering said furnace.

3,589,699

DISCHARGE TAP FOR MELTING FURNANCES

William F. Bogan, Bethel Park Boro, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 4, 1969, Ser. No. 847,376
Int. Cl. C21b *7/12*
U.S. Cl. 266—42 15 Claims



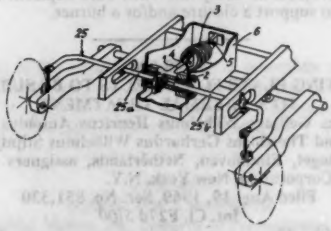
There is disclosed a discharge tap for melting furnaces, especially applicable, but not necessarily limited, to a slag discharge tap for cupolas. A refractory tubelike element is supported in an upwardly and outwardly inclined position on the furnace with its lower end below the normal liquid level in the furnace and its outer end at a preestablished overflow level. The tube is a good heat-conducting material, whereby heat is rapidly conducted to its exposed outer end, and is also an electrical conductor so that it may function as a resistance heater to a heating current supplied thereto in such manner that most of its length is traversed by the current.

3,589,700

FLEXIBILITY CORRECTOR FOR VEHICLE SUSPENSION

Jean Ruet; Jean-Pierre Serpette; Jacques Pierre; Jean Jacques Carduner; Michel Lietard, and Jacques Remaud, all of Billancourt, France, assignors to Regie National Des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France

Filed May 13, 1968, Ser. No. 728,623
Claims priority, application France, May 17, 1967, Nov. 23, 1967, Nov. 24, 1967, Jan. 30, 1968, 106,721;129,398;129,538;137,991
Int. Cl. B60g *17/02*
U.S. Cl. 267—11 11 Claims



A flexibility corrector for a vehicle suspension system, which comprises a resilient member mounted between suspension elements movable in relation to each other and adapted to reduce the suspension flexibility when the suspension departs from its mean position, said corrector being characterized in that said resilient member is mounted in a state of unstable equilibrium in said mean position of the suspension, whereby the force applied to the suspension when the latter departs from said mean position tends to accentuate this deviation.

3,589,701

VEHICLE SUSPENSIONS

David William Gee, Warwickshire, England, assignor to Girling Limited, Tyseley, Birmingham, England

Filed Oct. 11, 1968, Ser. No. 766,730
Claims priority, application Great Britain, Oct. 24, 1967, 48,187/67
Int. Cl. B60g *3/06, 11/58, 15/06*
U.S. Cl. 267—64 4 Claims

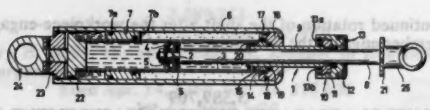
In a suspension unit for a vehicle wheel incorporating a helical compression spring and a single tube hydraulic

damper containing a gas spring adapted to support part of the load on the wheel the gas spring is formed by a volume of air or other gas under pressure which is not confined to any part of the damper cylinder but is allowed to rise to the upper end of the cylinder where the piston rod of the damper passes through an assembly including an oil seal and a reservoir for oil in contact with the seal.

3,589,702
GAS SPRINGS

Rudolf Spieth, Plochingerstrasse 156, Esslingen, and Gunter Otto, Linderstrasse 3, Altbach, both of, Germany

Filed Nov. 13, 1968, Ser. No. 775,416
Claims priority, application Germany, Oct. 1, 1968, P 1800096.9
Int. Cl. F16f *5/00*
U.S. Cl. 267—64 7 Claims



An improved gas spring with a volume of pressure gas, comprising a cylinder and, arranged therein, an axially displaceable displacement rod, passing sealingly towards the outside through one end of the cylinder, wherein the spring characteristic is variable as a function of the stroke of the displacement rod. Preferably, the displacement rod comprises an inner rod and an axially displaceable sleeve, surrounding the same.

A second outer cylinder may be arranged concentrically about the cylinder in spaced relationship therefrom, the annular space between the said cylinders being filled partly with pressure gas, whilst the other part of the said annular space and the whole interior of the said inner cylinder are filled with a liquid and wherein the interior rod is connected with a piston equipped with restricting passages.

3,589,703
DISC VALVES

Donald Brookman, Helsby, England, assignor to The Metallic Valve Company Limited, Birkenhead, Cheshire, England

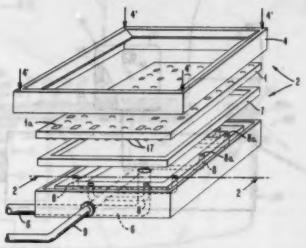
Filed Mar. 26, 1968, Ser. No. 716,198
Claims priority, application England, Mar. 28, 1965, 13926/67
Int. Cl. F16f *1/22*
U.S. Cl. 267—162 10 Claims

Spring means for urging a valve plate against a valve seat in an annular check valve, one disclosed each comprising at least two sprint plates adapted to engage one another in a valve, each plate having a plane portion out of which are bent arcuate spring portions of each of which the axial direction of bending, the peripheral direction, and the inner and outer radii are interrelated to substantially avoid the risk of spring portions of adjacent plates becoming entangled with one another in a valve.

3,589,704
HOLDERS FOR IRREGULARLY FORMED INTEGRATED CIRCUIT DEVICES

Frank J. Kurtz, Esopus, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 12, 1968, Ser. No. 774,740
Int. Cl. B25b *11/00*
U.S. Cl. 269—7 13 Claims

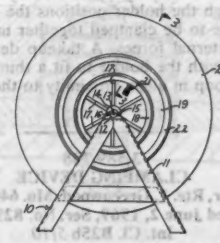


A fluid underlying or encasing a thin multilayer printed circuit device with an irregular underside structure provides uniform backing support for electrical probing of the device. In this instance the irregular structure is formed in relief from a main substrate board by joinder to the board of external circuit chip elements and discrete point-to-point connection wires. In one embodiment the device is clamped in a work holder with which it forms an airtight chamber. This chamber is filled to capacity with an incompressible dielectric fluid which supports the device and enables it to withstand substantial external forces as might be caused by the pressure of a matrix of test probes. Supply and vent valves are manipulated first to admit the fluid while releasing entrapped air and then to isolate the fluid when the chamber is filled so that external forces are transferred to the fluid only through the chamber wall formed by the device. The same valves are manipulated in reverse to remove fluid as one device is uncoupled from the fixture and replaced by another.

3,589,705
APPARATUS SUPPORTING RIM MOUNTED TIRE FOR ROTATION IN PREDETERMINED PLANE

Hugh M. Parker, 718 Cherokee St., Talladega, Ala.

Filed May 5, 1969, Ser. No. 821,920
Int. Cl. B23q *3/08*
U.S. Cl. 269—20 6 Claims

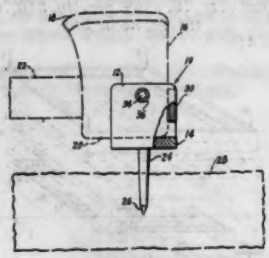


Apparatus supporting rim-mounted tire for rotation in predetermined plane including supporting spindle with rigid annular member surrounding spindle and supported thereby for rotation in plane perpendicular to spindle. Annular, inflatable member between rigid annular member and rim secures rim to rigid annular member.

3,589,706
HOLDER FOR SHARPENING HOG AXES

Adrie L. Putman, 100 Mountain Fir Drive, Dunsmuir, Calif.

Filed Oct. 30, 1968, Ser. No. 771,945
Int. Cl. B25b 3/00
U.S. Cl. 269—102 1 Claim

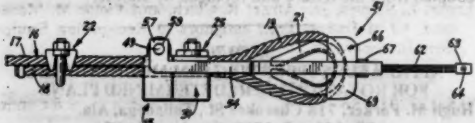


A substantially U-shaped holder is adapted to receive the butt end of a woodsman's ax, commonly known as "hog ax" and is provided with means for supporting the holder in position with the ax therein during the sharpening operation.

3,589,707
WIRE ROPE CLIP HOLDER AND LOOP TAKE-UP DEVICE

Franklin P. Becker, Decatur, and Edward Crook, Jr., Fort Wayne, both of, Ind., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Filed Oct. 9, 1968, Ser. No. 766,207
Int. Cl. B23q 3/06
U.S. Cl. 269—103 18 Claims



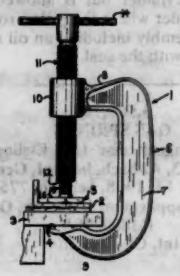
A holder with a longitudinal channel aligning two strands of wire rope in a U-shaped clip carried by the holder. A rod extended through the holder positions the clip and portions of the wire rope to be clamped together in close configuration without external forces. A takeup device mounted on the rod coacts with the holder to fit a thimble in the eye of the wire rope loop in close proximity to the clip located adjacent the loop.

3,589,708
CLAMPING DEVICE

David W. Cosner, Rte. 1, Greenwood, Mo. 64034

Filed June 2, 1969, Ser. No. 829,310
Int. Cl. B25b 5/10
U.S. Cl. 269—241 2 Claims

A clamping device for holding a workpiece between an anvil surface and a movable workpiece-engaging member has a threaded adjustment shaft received in a threaded sleeve portion of a frame for moving the workpiece-engaging member toward and away from the anvil surface. The workpiece-engaging member is mounted on one end of a rod having the other end threadedly received in a recess in one end of the threaded adjustment shaft and the threads on the shaft and rod are of the same hand and of different leads whereby relative movement between the shaft and rod occurs upon

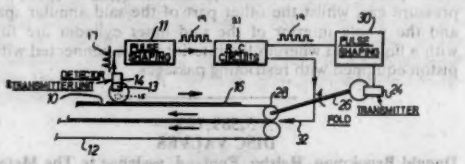


continued rotation of the shaft after the workpiece-engaging member engages the workpiece.

3,589,709
CONTROL APPARATUS FOR THE MEASUREMENT AND FOLDING OF FLAT WORKPIECES

David Hey, Huddersfield, and Goeffrey Luther Grimwood, Wooldale, near Holmfirth, both of, England, assignors to Thomas Broadbent & Sons Limited, Huddersfield, Yorkshire, England

Filed June 5, 1968, Ser. No. 734,654
Claims priority, application Great Britain, June 17, 1967, 28023/67
Int. Cl. B65h 45/06
U.S. Cl. 270—80 8 Claims



A control apparatus for use with a machine for folding a flat workpiece comprising a first detector and transmitter unit arranged to detect and measure a dimension of a travelling workpiece and transmit a signal whose value is representative of said dimension to a first memory store arranged to accept said signal, means for transferring at least part of said signal in the first memory store from said first store to a second memory store, and a second transmitter arranged to transmit to said second memory store a further and cumulative signal representative of the passage of said workpiece relative to a folding station, said second memory store being arranged to initiate a folding operation when the required length of workpiece has passed said folding station.

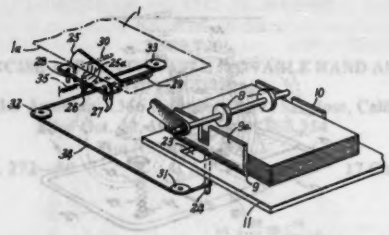
3,589,710
DEVICE FOR DETERMINING A FEEDING POSITION FOR AN ORIGINAL FORM IN A COPYING MACHINE

Ohiko Yagi, and Nobuyuki Yanagaw, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 17, 1968, Ser. No. 784,367
Claims priority, application Japan, Dec. 19, 1967, 42/81330
Int. Cl. B65h 1/04
U.S. Cl. 271—9 5 Claims

A device for alignment of the side edges of a copy sheet with an original in which the support for the original has a sliding member mounted thereon to align with the side edge of the original. This sliding member is connected by a flexible connector to another sliding member mounted on the copy sheet support and abutting the side edge of the copy sheet.

Movement of the original sliding member is transmitted by the flexible connection to the copy sheet sliding member so



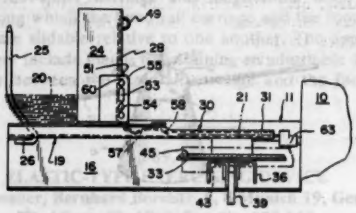
that the two sliding members are maintained in planar alignment.

3,589,711

SEPARATOR SHEET FEEDER

Harry H. Holly, Olympia Fields, Ill., assignor to Hollymatic Corporation

Filed Apr. 14, 1969, Ser. No. 815,636
Int. Cl. B65h 5/00
U.S. Cl. 271—10 17 Claims



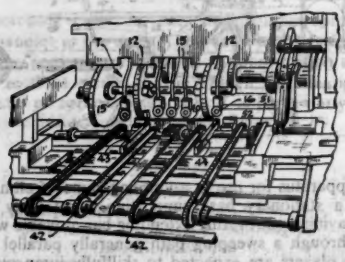
An apparatus for applying a separator sheet to each of a series of molded articles ejected in a path from a molding device comprising a retainer beside the path for retaining a supply of the sheets with an end sheet of the supply exposed, sheet projecting means for projecting a forward edge portion of the successive end sheets toward this path, a conveyor engaging each end sheet successively and movable into the path to withdraw the sheets from the supply and move the sheets into the path to be contacted by an ejected article and pressure means for pressing the forward edge portion of each end sheet against the conveyor means in a pinching action to aid in withdrawing the end sheet from the supply by the movement of the conveyor means.

3,589,712

SIGNATURE MACHINES

John Balla, Argo, Ill., assignor to Chicago Machinery Laboratory, Inc., Chicago, Ill.

Filed Mar. 3, 1969, Ser. No. 803,641
Int. Cl. B65h 3/08
U.S. Cl. 271—31 4 Claims



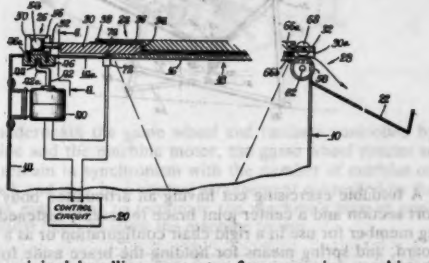
A signature feeding machine, in which signatures are transferred one by one from a stack in a supply station, is so constructed as to enable the signatures to be separated automatically.

3,589,713

ORIGINAL HANDLING APPARATUS FOR COPYING MACHINES

John J. Schulze, Prospect Heights, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Mar. 26, 1969, Ser. No. 810,761
Int. Cl. B65h 3/06
U.S. Cl. 271—41 15 Claims



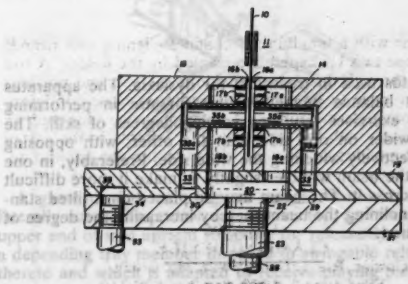
An original handling apparatus for a copying machine is capable of handling not only single original sheets, but also stacks of original sheets to be copied as well as individual thicker original items such as books and the like. When a stack of sheets is to be copied, each sheet is first presented to an illumination station and then automatically fed from the machine. Single sheets or other relatively thin original items are also fed from the machine after illumination. When a thick item such as a book is copied the feeding mechanism is automatically disabled. Feeding of individual sheets from a stack or of single sheets is accomplished by means of a sheet-holding magazine mounted for movement between an illumination area and a sheet drive structure capable of engaging and removing sheets from the magazine.

3,589,714

MULTI-ITEM DETECTOR

Ernest L. Staples, Jr.; Albert R. Clark, and Victor M. Moreland, all of Dallas, Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Jan. 23, 1969, Ser. No. 793,300
Int. Cl. B65h 7/02
U.S. Cl. 271—56 8 Claims

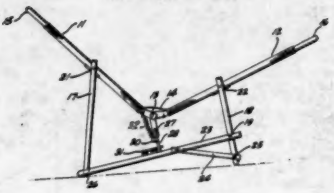


Apparatus for detecting the occurrence of a simultaneous multiple feed of documents when a vacuum source operates on documents being carried away from a document feeder so as to attract the documents toward a sensing station having an exhaust port for positive air pressure. A multiple feed of documents increases the pressure at the exhaust port. A pressure sensing device is coupled to the exhaust port for detecting such increase in pressure, thereby detecting a multiple feed of documents.

3,589,715
CONVERTIBLE FOLDABLE EXERCISE COT

Morris Mark, 4147 Mantova Drive, Los Angeles, Calif., and Joseph W. Mark, 13007 Cimarron Ave., Gardena, Calif.

Filed Oct. 7, 1968, Ser. No. 765,389
Int. Cl. A63b 23/02
U.S. Cl. 272—58 7 Claims

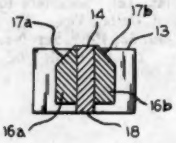


A foldable exercising cot having an articulated body support section and a center joint brace releasably fastened to a leg member for use in a rigid chair configuration or as a slant board, and spring means for holding the brace aside for use of the cot as an exercising cot; and a hinged support leg of greater span than the body support section of the cot releasably secured to the other leg member for use as an exercising cot or a rigid chair and releasable for use of the cot as a slant board or a beach chair, the releasable leg being pivotable to a pullup bar position.

3,589,716
BALANCE BEAM APPARATUS

Sherwin W. Footlik, Chicago, Ill., assignor to Reading Research Foundation, Inc., Chicago, Ill.

Filed Feb. 12, 1969, Ser. No. 799,550
Int. Cl. A63b 23/04
U.S. Cl. 272—60 7 Claims



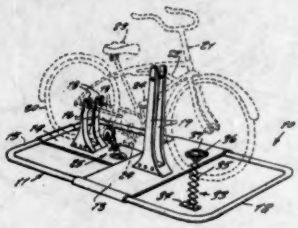
Apparatus used in treatment for dyslexia. The apparatus comprises balance beam facilities for use in performing balancing exercises requiring varying degrees of skill. The beam is wider on one side than the other, with opposing bevels effectively widening the wide side. Preferably, in one position, the beam wobbles slightly to make it more difficult to walk across it. The beam may be placed on a tilted standard for inclining the beam thereby increasing the degree of skill required.

3,589,717
BICYCLE-SUPPORTING STAND FOR EXERCISING

Charles M. Alexander, 937 Joyce Street, Apt. B, Atlanta, Ga.

Filed Aug. 5, 1969, Ser. No. 847,655
Int. Cl. A63b 21/00, 23/04, 69/16
U.S. Cl. 272—73 5 Claims

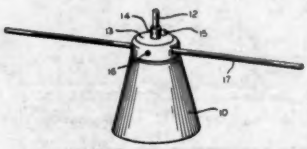
A stand for supporting a conventional bicycle in a stationary position so that the same may be used as an exercising device. The stand incorporates a peripheral tubular frame and a pair of sheet metal panels attached to each other and to the tubular frame to form a platform upon which there are a pair of upstanding rear braces and a pair of upstanding front braces between which the bicycle is placed and supported in an elevated condition so that a person may sit thereupon and exercise himself by pedaling.



3,589,718
JUMPING TOYS

Edward T. Bessler, 2483 S. Delaware Avenue, Milwaukee, Wis.

Filed Sept. 27, 1968, Ser. No. 763,062
Int. Cl. A63b 5/22
U.S. Cl. 272—74 6 Claims

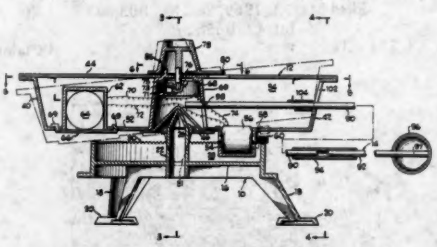


A battery-powered, motor-driven turret supports and actuates horizontally disposed rods for providing an "exercise-by-jumping" device. The turret with its rods can be readily separated from the battery. The rods are pliable and can be vertically adjusted relative to the support. In one embodiment, the turret may be mounted on a vertical surface and the rods bent at their ends, these bent ends extending horizontally for jumping.

3,589,719
GAME APPARATUS WITH JUMPING STICK

Marvin I. Glass; Jeffrey D. Breslow, and Burton C. Meyer, all of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

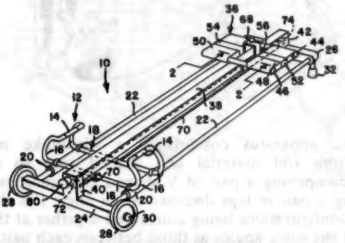
Filed Mar. 24, 1969, Ser. No. 809,556
Int. Cl. A63b 5/22
U.S. Cl. 272—74 9 Claims



Game apparatus for use in a jumping game of elimination including a stationary base supporting a rotatably driven member having an outwardly extending bar movable with the member through a sweeping path generally parallel to the floor. The players are expected to skillfully jump over and avoid contact with the sweeping bar. Momentary contact with the bar is indicated by termination of the bar movement.

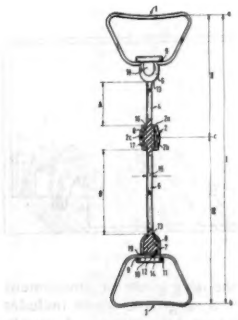
If the bar is struck by a player, the outer end of the bar drops to the floor and the drive between the base and the rotatable member is interrupted.

3,589,720
EXERCISE APPARATUS WITH MOVABLE HAND AND FOOT PLATFORMS
Alexander Agamian, 1366 Kotenberg Ave., San Jose, Calif.
Filed Oct. 22, 1969, Ser. No. 868,354
Int. Cl. A63b *21/00*
U.S. Cl. 272—80 **17 Claims**



An apparatus for physical exercise having a handrail carriage, a foot-slider carriage and longitudinal track guide means along which the hand rail carriage and the foot-slider carriage are slidable relative to one another. The apparatus may further include means for retaining an adjustable drag or resistance between the handrail carriage and the foot carriage.

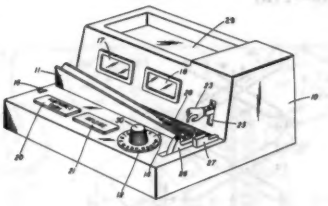
3,589,721
ELASTIC-TYPE EXERCISING DEVICE
Willi Cronauer, Bernhard Borststr. 5, 8 Munich 19, Germany
Filed Sept. 22, 1969, Ser. No. 852,163
Claims priority, application Germany, May 20, 1969, G 69 20 263.7
Int. Cl. A63b *21/00*
U.S. Cl. 272—82 **8 Claims**



An exercising apparatus has a single rubber cord, stirrup-shaped handles at the ends of the cord, and a barrel-shaped grip on the cord spaced from the handles in such a manner that the sections of the cord separated by the grip have a length ratio of approximately 5:8. It is particularly suitable for exercises performed in and under water.

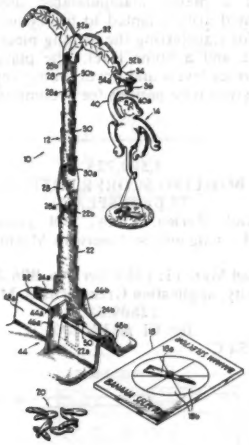
3,589,722
GAME OF NIM
Robert L. Brass, 1 Fellow St., Westport, Conn.
Filed Sept. 17, 1968, Ser. No. 760,182
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 (E) **18 Claims**

I disclose a version of the game of Nim wherein one player plays against the machine. A number of marbles are positioned on an inclined rack. The player, by moving a slide adjacent to the lower end of the rack, and alternately the machine, by a motor driven arm, remove marbles. A removable game wheel is provided, depending upon the version of Nim being played. By the interaction of teeth and control



pins underneath the game wheel and ratchets controlled by the slide and the machine motor, the game wheel rotates so as to remain in synchronism with the number of marbles on the rack and also, by a control arrangement controlled by the control pins, so as to terminate the machine's turn at positions most likely to allow the machine to win.

3,589,723
DEVICE WITH DEPENDING TRAY
Marvin I. Glass, Chicago, and Jeffrey D. Breslow, Evanston, both of, Ill., assignors to Marvin Glass & Associates
Filed Dec. 3, 1968, Ser. No. 780,695
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 **2 Claims**



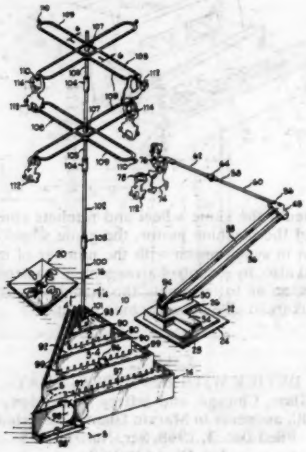
A game device including an upright structure having a laterally outwardly portion adjacent its top, and means at the upper end of said upright structure for releasably supporting a depending tray member disposed in swingable relationship thereto and which is adapted to receive playing pieces. The support means for the depending member comprises a looplike structure, and the depending member includes a portion adapted to bear against the base surface of the looplike structure. The game includes a plurality of playing pieces and chance means for determining the number of playing pieces to be placed on the tray, and the placement of an excessive number of pieces on the tray causes the latter to fall from the support means. The game is disposed in a container which is openable to present hingedly connected sidewalls adapted to receive the upright structure of the game device.

3,589,724

GAME WITH TOWER AND CRANE

Gordon Barlow, Evanston, and Harry Disko, Park Ridge, both of, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 5, 1968, Ser. No. 781,498
Int. Cl. A63f 9/00
U.S. Cl. 273—1 (R) 7 Claims



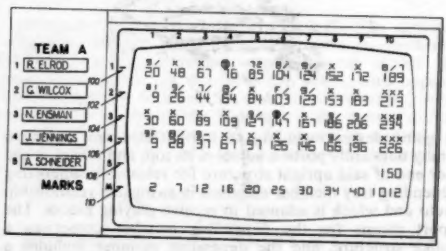
Game apparatus including a tower structure having a plurality of arms projecting outwardly at various levels, playing pieces adapted to be removably supported on the tower structure, and a player manipulatable device including pivotally mounted arms adapted to be moved vertically for engaging and for transferring the playing pieces between the tower structure and a home level. The playing pieces are disposed at various levels and novel timing apparatus is utilized to define given time periods for accomplishing the game objective.

3,589,725

AUTOMATIC BOWLING SCORER WITH CATHODE-RAY TUBE DISPLAY

Ralph Townsend, Darien, Conn., and James J. Walker, Bedford, N.H., assignors to American Machine & Foundry Company

Filed Mar. 11, 1969, Ser. No. 806,244
Claims priority, application Great Britain, May 14, 1968, 22809/68
Int. Cl. A63d 5/00
U.S. Cl. 273—54 C 26 Claims



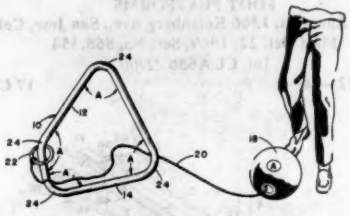
An automatic bowling scorer which calculates scores in accordance with the rules of the game from signals representative of pinfall and having a cathode-ray tube for presenting a visual display of the history of the game of bowling wherein the face of the cathode-ray tube is divided into identifiable discrete areas to represent the frames of the game for at least one player.

3,589,726

TETHERED KICKING BALL AND GOAL

William E. Crowder, R. D. 1, Mount, Wolf, Pa.

Filed Feb. 25, 1970, Ser. No. 13,895
Int. Cl. A63b 67/00
U.S. Cl. 273—98 7 Claims



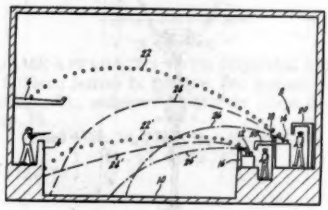
A game apparatus comprising: a wicketlike member formed from rod material and shaped into an endless member comprising a pair of V-shaped configurations each comprising a pair of legs disposed at an angle less than 90° and said configurations being connected together at the ends thereof at the same angles as those between each pair of legs to form four V-shaped configurations, any one of which may serve as base means to flatly engage a playing surface while supporting another one of said configurations in substantially upright position therefrom so that a propelled member may be projected through said upstanding configuration. A flexible member of substantial length connects the propelled member and wicketlike member so that the propelled member if propelled with sufficient force may move the wicketlike member and dispose a different upstanding configuration in position through which the propelled member may be moved.

3,589,727

SHOOTING RANGE AND GAME APPARATUS

Edward D. Lowry, New Haven, Conn., assignor to Olin Corporation

Filed Aug. 21, 1969, Ser. No. 851,877
Int. Cl. F41j 9/18
U.S. Cl. 273—101 4 Claims



Apparatus for a shooting game or amusement which can be played indoors on a range and which includes a shooting station and a target-launching station. A number of target launchers are positioned at the launching station, the launchers being operable to launch targets toward the shooting station and the shooter. The target launchers are adapted to launch targets at any of a number of different launch velocities and trajectories.

3,589,728

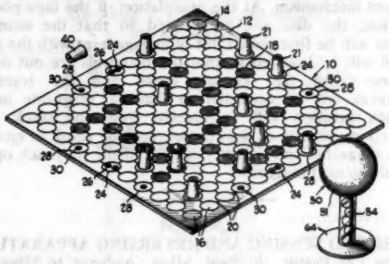
BOARD GAME APPARATUS

Norman McFarland, Urbana, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 7, 1969, Ser. No. 797,526
Int. Cl. A63f 3/02
U.S. Cl. 273—134 2 Claims

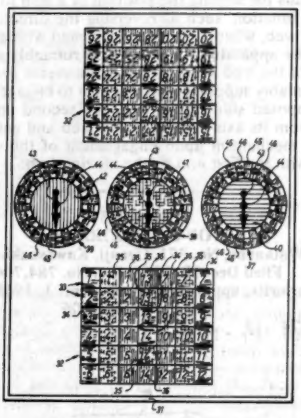
Game apparatus for use by two or four game players including a game board having a network of game stations

bearing different colors, and a movement sequence indicator for randomly indicating the sequence of movement of playing pieces from a game station bearing one color to a station bearing another color. The movement sequence indicator consists of an opaque hollow chamber which communicates with a transparent elongated column, and a plurality of colored balls are loosely disposed within the chamber for



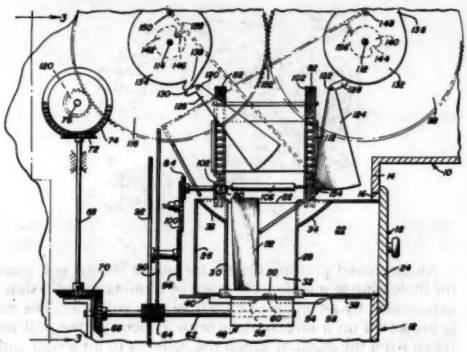
movement into the transparent column. The balls in the indicator are colored similarly to the stations so that the sequence of balls in the transparent column designates the sequence of movement of playing pieces on the board. The object of the game is to move a playing piece from a designated starting position on one side of the board to a designated goal position on the other side of the board.

3,589,729
BOARD GAME APPARATUS WITH SPINNERS
Jean Girard, 33 Rowlinson Street, Terrebonne Heights, Quebec, Canada
Filed May 1, 1969, Ser. No. 821,011
Int. Cl. A63f 3/00
U.S. Cl. 273—135 B **2 Claims**



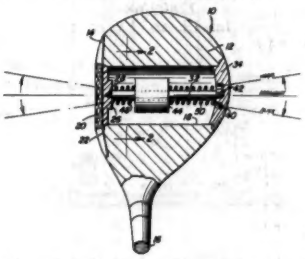
A game playable by two persons and comprising two playing surfaces, each divided into three sets of differently colored play areas marked with an identical series of different numbers, the series of numbers on one surface differing from those on the other. The game further includes three spinners, each colored as one set of play areas, each spinner including a rotatable pointer and sectors divided into groups of numbers identical to the numbers of the play areas, the sectors of one group alternating with the sectors of the other group.

3,589,730
PLAYING-CARD SHUFFLER
John P. Slay, 10858 Sharondale Lane, Dallas, Tex.
Filed Aug. 7, 1969, Ser. No. 848,308
Int. Cl. A63f 1/12
U.S. Cl. 273—149 R **9 Claims**



A card-deck shuffling assembly including a horizontally disposed vertically vibratory support upon which a deck of cards may be placed and supported on edge for upwise random displacement. The assembly includes structure for intermittently sequentially gripping cards which are upwardly displaced, elevating the gripped cards to a point spaced above the remainder of the deck, releasing the elevated cards and immediately thereafter laterally displacing the released cards in one direction as they fall downwardly toward the support and laterally displacing the cards disposed on the support in the opposite direction.

3,589,731
GOLF CLUB HEAD WITH MOVABLE WEIGHT
Charles W. Chancellor, Jr., Midland, Tex., assignor to Chancellor Chair Company
Filed Dec. 29, 1969, Ser. No. 888,473
Int. Cl. A63b 53/08
U.S. Cl. 273—170 **6 Claims**



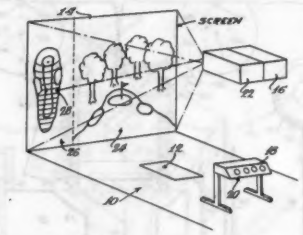
A golf club head incorporating a hollow interior with a movable weight supported on a mounting rod which can be oriented in different angular positions to counteract the tendency of a golfer to hook or slice the ball and to increase the distance which the ball is driven due to the additional forces exerted on the ball by the movable weight. The movable weight is centered on the mounting rod by spring devices and the overall shape and configuration of the golf club head is not changed.

3,589,732

MAP SPOT PROJECTION SYSTEM FOR A GOLF GAME

Jack A. Russell, Muskegon, and James R. Feeney, Grand Rapids, both of, Mich., assignors to Brunswick Corporation

Filed Sept. 4, 1969, Ser. No. 855,150
Int. Cl. A63b *67/02, 69/36*
U.S. Cl. 273—176 FA 16 Claims



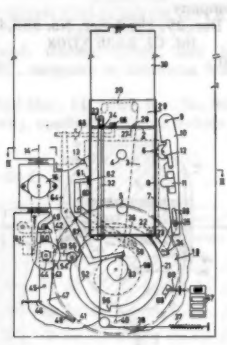
An improved plotting system for use in indoor golf games for indicating to a golfer, the point of termination of a shot as determined by a computer on a map of a golf hole. The map is projected on a screen along with a scene of the golf hole taken from the point at which the golfer is to hit a shot and a ball spot projector which illustrates the trajectory of the ball on the projected scene is also used to indicate the point of termination on the map. The position of the map on the screen is preoriented so that the location on the hole from which the golfer is to hit a shot and which is represented by the scene projected on the screen is always located at the same point on the screen.

3,589,733

APPARATUS FOR CHANGING AND PLAYING BACK RECORDER TAPE MAGAZINES

Tadeus Piotrowski, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1968, Ser. No. 733,176
Claims priority, application Austria, June 16, 1967, 5603
Int. Cl. B65h *19/04*; G11b *5/00, 23/08*
U.S. Cl. 274—4 27 Claims



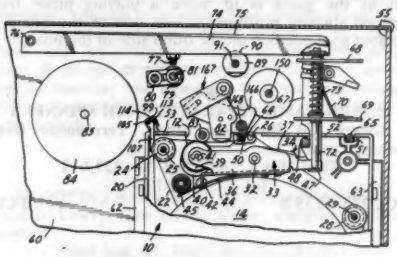
An apparatus for playing back and for changing tape recorder magazines in a recorder/playback device, each magazine having two winding cores and at least one aperture across which a tape extends from one winding core to the other so that the tape will be exposed at the aperture. Magazines may be stacked loosely one on top of the other in a storage space mounted on the apparatus, the lowermost magazine being in an operative playback position. Playback mechanisms for engaging the magazine in the playback position carry a scanning member or magnetic head for insertion into the magazine and engagement with the tape, and mandrils for engagement with each of the winding cores of the magazine are carried on a pivotally mounted frame. The playback mechanisms are moved into an operative position when a magazine has been fed from the stack to the playback position. A transport mechanism operates to remove the lowermost magazine in the stack from the playback position through a slot in the storage rack after the tape on the magazine has been completely played. The playback mechanisms and the transport mechanism are actuated by a control disc which has a plurality of cam tracks for operating the various elements of the playback mechanism and the transport mechanism. At the completion of the tape-playing operation, the disc will be rotated so that the scanning member will be first pulled out of engagement with the tape, the full will be lowered so that the mandrels are out of engagement with the winding cores and the transport mechanism will be operated so that the magazine in the playback position will be ejected from the stack. One complete revolution of the control disc will result in ejection of one magazine and commencement of the playback operation for the next magazine.

3,589,734

WEB END SENSING AND REVERSING APPARATUS

Sheldon Lee Pastor, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sept. 30, 1969, Ser. No. 870,355
Int. Cl. G11b *5/10*
U.S. Cl. 274—4 24 Claims



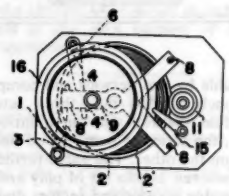
Apparatus for sensing the position of a web for performing a control function, such as reversing the direction of movement of a web, wherein the web is formed with a longitudinal slot and the apparatus has a first arm rotatably supported on one side of the web which extends transverse to the web and which rotatably supports a second arm to engage the web slot on the opposed side of the web, the second arm extending radially from its axis to contact the web and activate a web-reversing mechanism upon engagement of the web slot and rotation with the first arm by the moving web.

3,589,735

TOY PHONOGRAPH

Katsumi Watanabe, No. 371, Ozenji, Kawaskaki-shi, Japan

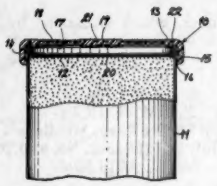
Filed Dec. 18, 1968, Ser. No. 784,704
Claims priority, application Japan, Mar. 1, 1968, 43/12865
Int. Cl. G11b *17/06*
U.S. Cl. 274—15 4 Claims



A toy phonograph having a rotatable turntable with a lifting cam in the center of the turntable onto which a pivoted

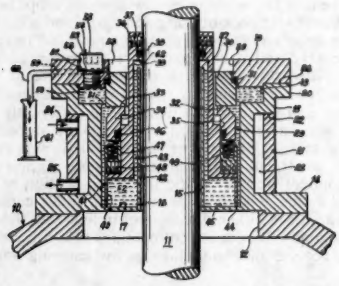
lifting arm travels at the end of a play of record to lift up a hinged overchanging loudspeaker to free a pivoted tone arm to return to the periphery of the turntable and also having a pressing mechanism to press the loudspeaker against the tone arm while playing.

3,589,736
SOUND-REPRODUCING CONTAINER COVERS
Harry Gorman, 2717 Holland Ave., New York, N.Y.
Filed Aug. 2, 1967, Ser. No. 657,819
Int. Cl. B41b *1/20*
U.S. Cl. 274—42 **1 Claim**



A synthetic resin container cover, e.g. for coffee cans once the sealed cover end is removed, which has a disc formed with a sound-reproducing groove of a phonograph record, an apron or flange unitary with the disc and extending all around the latter for engagement with the can, and a weakened portion or bead enabling separation of the integral disc from the flange when the recording is to be played.

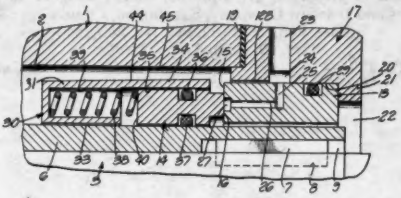
3,589,737
MECHANICAL SEAL FOR A VERTICAL ROTATING SHAFT
Joseph Sedy, Skokie, Ill., assignor to Crane Packing Company, Morton Grove, Ill.
Filed Feb. 17, 1969, Ser. No. 799,637
Int. Cl. F16j *15/16, 15/40*
U.S. Cl. 277—17 **10 Claims**



A sealing arrangement for a vertically disposed shaft for a gas under pressure in a reactor or the like wherein a single rotary seal is used, preferably of the end face type, with a fixed quantity of lubricant for the seal pressurized by the gas. The lubricant is held by the gas at the seal faces even through leakage of the lubricant occurs across the faces and the quantity is therefore continually diminishing. Means are provided for measuring the quantity of escaped lubricant to determine when the supply of lubricant should be replenished to avoid dry running of the seal.

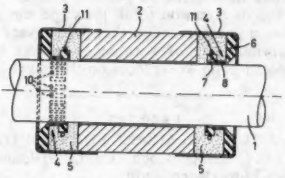
3,589,738
MECHANICAL SEAL FOR PULP PUMPS
Herbert E. Tracy, Alhambra, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed June 13, 1969, Ser. No. 832,967
Int. Cl. F16j *15/34, 15/54*
U.S. Cl. 277—74 **6 Claims**

A mechanical seal assembly for paper pulp pumps in which clean fluid flows between the seal faces and flushes the pulp



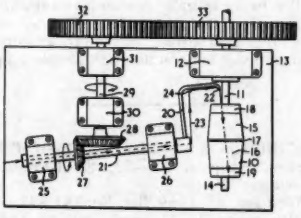
from the seal assembly. Such an assembly in which fluid also flows along the outer periphery of the seal rings.

3,589,739
SEALING MEMBER
Gerard Johan Scholten, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 3, 1969, Ser. No. 854,960
Claims priority, application Netherlands, Sept. 5, 1968, 6812699
Int. Cl. F16j *15/34, 15/54*
U.S. Cl. 277—96 **3 Claims**



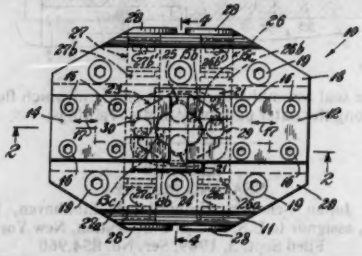
A sealing member for a shaft passed through a structural component which sealing member consists of two comparatively rigid annular parts connected by a twistable ring between them. A plurality of regularly distributed very shallow grooves are provided in the sealing surface of the twistable ring, which grooves, in the case of a radial seal, extend axially and, in the case of an axial seal, extend radially. One of the comparatively rigid annular parts is constructed as a connection member and the other comparatively rigid part has some freedom of movement with respect to the connection member.

3,589,740
FLEXIBLE DIAPHRAGMS
Barry Owen Beach, Castle, Bromwich, Birmingham, England, assignor to Dunlop Rubber Company Limited, London, England
Division of Ser. No. 353,415, Mar. 20, 1964, Pat. No. 3,414,449.
Filed Dec. 8, 1967, Ser. No. 707,905
Int. Cl. F16j *15/00*
U.S. Cl. 277—212 **1 Claim**



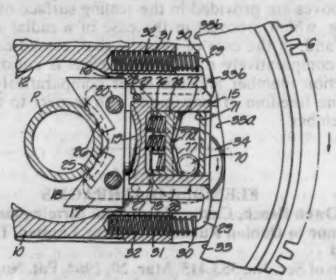
A fluid-retaining seal for use as a fluid spring is provided which is cup shaped and consists of resilient material reinforced with cords which extend along the sidewalls and cordally cross the end wall.

3,589,741
FLUID-ACTUATED CHUCK
Fernand L. Germain, Jr., Monroe, Conn., assignor to The Goss and Deleeuw Company, Kensington, Conn.
Filed Feb. 28, 1969, Ser. No. 803,167
Int. Cl. B23b 31/16, 31/30
U.S. Cl. 279—4 2 Claims



A chuck having a plurality of movable jaws that grasp a workpiece on which an operation is to be performed by the jaws being moved linearly by each having an identical lost-motion connected to a pivotable member that is rotated by linearly movable fluid-actuated pistons. The use of a pivotable member that is common to all jaws and the connections thereto provide a jaw movement that is relatively large to accommodate various sizes of workpieces but yet which is also precise in centering the workpieces on the chuck.

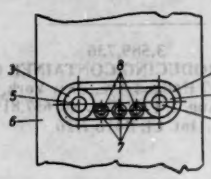
3,589,742
JAW-ACTUATING MEANS FOR PIPE TONGS
Howard S. Flick, Long Beach, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.
Filed Aug. 20, 1969, Ser. No. 851,663
Int. Cl. B23b 31/16
U.S. Cl. 279—71 16 Claims



Jaw-actuating means for pipe tongs in which a roller is interposed between a pair of relatively movable cam surfaces for actuating a jaw into gripping engagement with a pipe joint, the roller being initially resiliently centralized in engagement with one of the cam surfaces and out of engagement with the other cam surface, but the roller shifting to engage both cam surfaces upon actuation towards a pipe-engaging position.

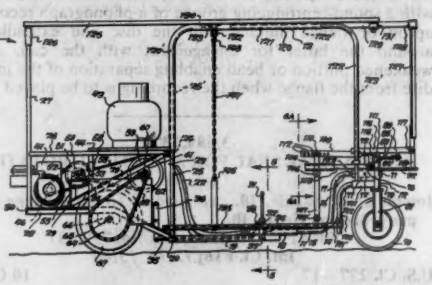
3,589,743
TOE IRON FOR SAFETY SKI BINDINGS
Hannes Marker, Haupstr. 51—53, 81 Garmisch-Partenkirchen, Germany
Filed Jan. 13, 1969, Ser. No. 791,548
Claims priority, application Germany, Jan. 22, 1968, 16 78 P 16 78 278.8
Int. Cl. A63c 9/30
U.S. Cl. 280—11.35 5 Claims

A toe-backing member movable relative to the ski and extending at right angles to the surface of the ski to resiliently take up harmless lateral shocks. The backing element comprises a flexible endless band, which extends around at least



one retaining member, which is carried by a part that is secured to the ski.

3,589,744
FARM VEHICLE
Carl J. Hansen, West Shelby Road, Middleport, N.Y.
Filed July 9, 1969, Ser. No. 840,200
Int. Cl. A01d 90/00
U.S. Cl. 280—32.5 16 Claims

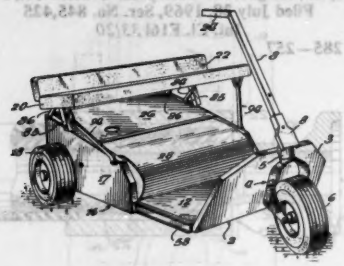


A farm vehicle for working on low-growing crops including a central frame section mounting an engine and a seat for an operator, a front-end steering section connected to the main frame assembly and a superstructure assembly connecting both to rigidize the vehicle, a telescoping linkage on the front-end section for mounting spaced wheels between which the distance can be varied to fit between differently spaced rows of crops, carriers mounted on the vehicle abreast of the vehicle operator, and a steering linkage for turning the front wheels. A modified embodiment includes a plurality of quick-disconnect fittings on the front-end section to permit the central frame section to be mounted either centrally of the front end, or at either side thereof in line with the spaced wheels, the quick-disconnect connections also functioning to selectively receive supplemental rigs for carrying additional riders.

3,589,745
COLLAPSIBLE VEHICLE
Lawrence W. Dougherty, 1516 W. St. James Place, Arlington Hts., and Terence J. Gallagher, 1708 W. Lincoln Road, Mount Prospect, both of, Ill.
Filed Mar. 20, 1968, Ser. No. 714,588
Int. Cl. B62b 11/00
U.S. Cl. 280—36 6 Claims

A vehicle collapsible to occupy a smaller volume for storage and transportation purpose which has a front and rear frame held together in sliding relationship so that the vehicle can be reduced in length for storage and extended in length for operation. The vehicle has a seat carried by the rear frame which includes a back support member pivotally movable with respect to the rear frame for folding into an out-of-the-way horizontal position. The rear wheels of the vehicle are carried by a suspension means which holds the wheels in alternative vertically extended and vertically retracted positions. Actuating means is provided for selectively moving the rear wheels to their retracted position by

pivoting the back support member to its horizontal position, and for moving the rear wheels to their extended position by pivoting the back support member to its generally upright



position. A steering bar is provided, which, when folded, also serves the purpose of retaining all folding parts of the vehicle in their folded positions.

3,589,746
WIRE SHELF CART

Leslie R. Inglis, and Howard N. Bollinger, both of Cincinnati, Ohio, assignors to American Hospital Supply Corporation, Evanston, Ill.

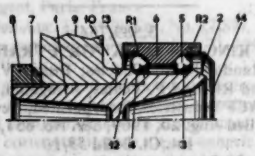
Filed Oct. 16, 1969, Ser. No. 867,026
Int. Cl. B62b *5/00*
U.S. Cl. 280—79.3 **11 Claims**

A wire shelf cart equipped with casters and having a plurality of horizontal wire shelves joined at opposite ends by upstanding wire frames, the shelves and end frames defining channels or recesses in which L-shaped mounting clips are received for rigidly interlocking such frames and shelves.

3,589,747
ROLLING BEARING

Sture Lennart Asberg, Savedalen, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

Filed Apr. 9, 1969, Ser. No. 814,285
Claims priority, application Netherlands, Apr. 10, 1968, 6,805,108
Int. Cl. B62d *1/00*
U.S. Cl. 280—96.1 **14 Claims**



A bearing assembly for a wheel-mounting arrangement for a vehicle consisting of a stub axle member adapted to be mounted on a support member of the vehicle comprising at least one pair of axially spaced circumferentially extending inner raceways integral with the stub axle member, a common outer ring overlying said raceways and spaced therefrom to define an annular space for at least two rows of rolling elements, the wheel of the vehicle adapted to be mounted on said outer ring.

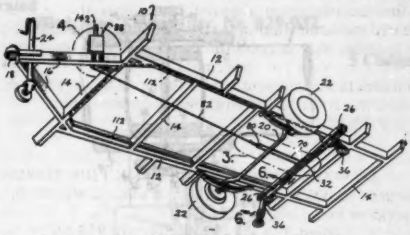
ERRATUM

For Class 280—112 see:
Patent No. 3,589,933

3,589,748
STABILIZING APPARATUS FOR A TRAILER OR LIKE VEHICLE

Milo E. Miller, 1016 S. 14th St., Goshen, Ind.

Filed Aug. 11, 1969, Ser. No. 848,848
Int. Cl. B60s *9/10*
U.S. Cl. 280—150.5 **9 Claims**



Apparatus mountable to the frame of a trailer or a like vehicle for stabilizing and leveling the trailer when parked. The stabilizing and leveling apparatus includes a pair of jacks, each having a housing part and a power-actuated pod which projects from one end of the housing part and which is shiftable between a ground-engaging extended position and a retracted position. The jacks are adapted for mounting on opposite sides of the trailer frame, with each jack having its housing part pivotally connected to the trailer frame so as to be swingable between stored and operative positions. Cable means are provided for causing movement of the jacks between stored and operative positions. An actuator adapted for mounting to the trailer at a convenient and accessible location is provided and includes parts connected to the cable means which, upon actuation, cause a shifting of the cable means and the movement of the jacks between stored and operative positions. The actuator also includes power delivery means, such as a hydraulic pump, operatively connected to each jack to cause extension of the jack pod when the jack is in its operative position and to cause retraction of the pod in preparation to place the jack in its stored position.

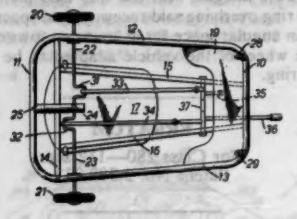
3,589,749
MANUALLY PROPELLED VEHICLES

George Malcolm Byrd, and Graham Jules Byrd, both of Wynch Farm, Ashton-Under-Hill, near Evesham, Worcestershire, England

Filed Jan. 8, 1969, Ser. No. 789,747
Claims priority, application Great Britain, Jan. 19, 1968, 2984/68
Int. Cl. B62m *1/14*
U.S. Cl. 280—211 **3 Claims**

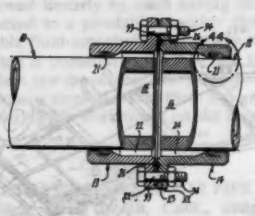
A manual- or foot-operated vehicle, primarily for amusement purposes, having a seat, two driving wheels on fixed

nonsteerable axes, the two wheels being driven independently by hand- or foot-operated levers or pedals, to provide



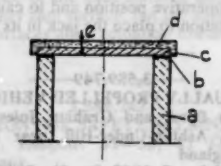
forward propulsion and a steering effect, and also at least one self-aligning castor wheel.

3,589,750
PIPE COUPLING
Paul G. Dunmire, Oakland, Calif., assignor to Christy Metal Products, Inc., Emeryville, Calif.
Filed June 13, 1969, Ser. No. 832,917
Int. Cl. F16l *17/02*
U.S. Cl. 285—95 **2 Claims**



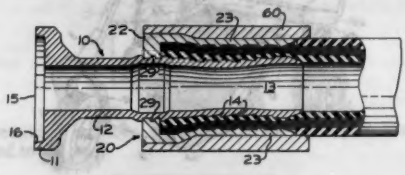
Flanged fluid coupling for interconnecting the open ends of a pair of pipe ends or other flow passages. Within the interior of each of two flanged fluid coupling halves, an O-ring is carried in a groove. Adjacent the sides of each groove, the bordering surfaces of the coupling confront the pipe periphery (those remote from the flanges being substantially parallel to the pipe periphery while the others taper increasingly radially away from the periphery in the direction of the flanges). Each of the O-rings is rolled onto its respective pipe end after its related coupling half has been placed on its end of the pipe. Then reverse movement of the coupling half rolls the O-ring into its associated groove. Bolts or other takeup means draw the two coupling halves together.

3,589,751
CERAMIC-TO-METAL SEAL
Serge Esnaud, Paris, France, assignor to CSF-Compagnie Generale De Telegraphie Sans Fil
Filed June 21, 1968, Ser. No. 738,888
Claims priority, application France, June 29, 1967, 112499
Int. Cl. F16l *49/00*; B05b *7/20*
U.S. Cl. 285—238 **6 Claims**



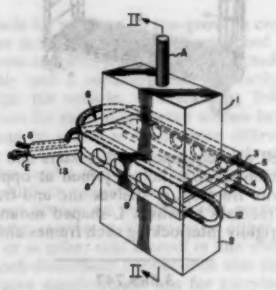
A method for reinforcing seals between a ceramic part and a metal part consisting in forming a hoop built up by one or more layers of particles deposited on one of the parts to be sealed to each other.

3,589,752
MECHANICAL JOINED HOSE COUPLING OF EXTRUDED COMPONENTS
Blaine G. Spencer, Peoria, and Lyle R. Clinebell, Wyoming, both of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed July 28, 1969, Ser. No. 845,425
Int. Cl. F16l *33/20*
U.S. Cl. 285—257 **2 Claims**



In a hose coupling having an extruded stem and an extruded collet which are joined so hydraulic hose can be clamped against the stem by the collet's gripping fingers when the hose is inserted therebetween, a mechanical connection between the stem and collet is effected by expanding a midportion of the stem into the peripheral dentured and grooved wall of an aperture in a radial flange forming part of the collet. The method of expanding the midportion of the stem and the configuration of dentured and grooved wall of the aperture insures a suitable mechanical joint between the stem and collet for a coupling operating at 4500 p.s.i. or above.

3,589,753
COUPLING APPARATUS
Michel Joseph Julien Pequignot, Paris, France, assignor to Quartz and Silice, Paris, France
Filed July 28, 1969, Ser. No. 845,357
Claims priority, application France, Aug. 5, 1968, 161864
Int. Cl. F16l *23/00*
U.S. Cl. 285—408 **8 Claims**

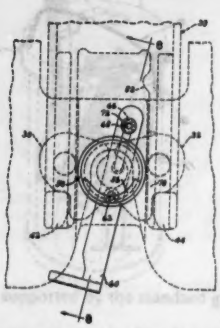


Apparatus is provided for coupling a pair of flanged tubes in clamped relation. Embracing the juxtaposed flanges is a collar containing channels so arranged that a flexible hose housed in the channels may be pressurized to expand radially and press the flanges together. When the pressure is relieved, the collar may be quickly slipped off the flanges to permit uncoupling of the tubes.

3,589,754
MANUAL KING PIN LOCK FOR A TRAILER HITCH
Robert W. Randolph, St. Charles; Duane V. Thornton, St. Charles, and Richard P. Yeates, Bridgeton, all of, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Aug. 20, 1969, Ser. No. 851,636
Int. Cl. B62d *53/10*
U.S. Cl. 287—20.5 **7 Claims**

A tractor-operated hitch for supporting a trailer on a railway car is provided with a manually operated locking device for the trailer kingpin, in addition to the usual kingpin clamp-

ing jaws. The locking device includes a shaft or disc rotatable in the bottom portion of the supporting plate of the hitch below the jaws and has a C-shaped rim extending round the bottom of the kingpin. The locking device is turned by a handle so that the rim blocks the opening in the supporting plate through which the kingpin enters and leaves the supporting plate. The handle is arranged so that it can be operated fully only when the jaws are closed and locked, and thus provides a warning if the jaws are not locked closed.

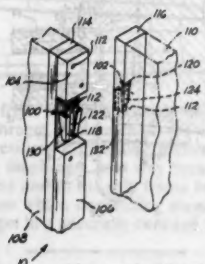


3,589,755

PREFABRICATED WALL-ATTACHMENT SYSTEM

Harold M. King, Phoenix, Md.

Filed June 20, 1969, Ser. No. 835,106
Int. Cl. F16b *3/00*
U.S. Cl. 287—20.924 **9 Claims**



A vertical-wall attachment system for building construction of the prefabricated type, including double tapered interconnective clips for installation on the end of the wall and on the structure to which the wall is to be secured, and modular spacers coacting to position the wall in relation to said structure, thereby coacting to provide tight attachment on vertical sliding interconnection of the clips.

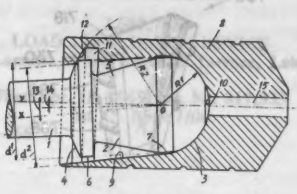
3,589,756

PISTON AND CONNECTING ROD ASSEMBLIES OF HYDRAULIC PUMP OR MOTOR

Francois C. Pruvot, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France

Filed Apr. 13, 1970, Ser. No. 27,871
Claims priority, application France, Apr. 21, 1969, 6912445
U.S. Cl. 287—21 **2 Claims**

Piston and connecting rod assembly for hydraulic pump or motor, wherein a piston comprising a chamber of substantially cylindrical configuration with a bottom of at least part-spherical shape corresponding to a part-spherical surface of the oscillating connecting rod adapted to be engaged therein, characterized in that said chamber has its longitudinal axis inclined in relation to the piston axis by an angle greater than the angle of oscillation of the connecting rod during the actual operation of the assembly, said chamber comprising a part-spherical retaining surface matching a corresponding surface of the connecting rod and having its center coincident with that of said bottom spherical surface of the piston, but with a greater radius than said last-named surface,



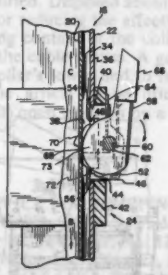
whereby when said connecting rod has been engaged home onto said chamber it is retained therein between said bottom surface and said retaining surface when its axis corresponds to the operative position of the two parts.

3,589,757

AUTOMATIC LOCK FOR EXTENSIBLE CAMERA TRIPOD LEG

Paul C. Mooney, Northbrook, Ill., assignor to Quick-Set, Incorporated

Filed June 3, 1969, Ser. No. 829,932
Int. Cl. F16b *7/10*
U.S. Cl. 287—58 **5 Claims**



A locking arrangement for an extensible telescoping tripod leg assembly which automatically locks against retraction thereof; characterized by the provision of a spring pressed constant rise cam member carried by one of the leg parts and normally held in contact with the other of the leg parts, relative movement of the leg parts to an extended position causing movement of the cam to a release position and attempted relative movement of the legs to a retracted position causing movement of the cam to a locking position where the cam urges portions of the legs together in locking engagement.

ERRATUM

For Class 287—189.36 see:
Patent No. 3,589,546

3,589,758

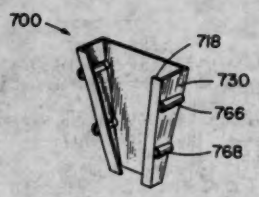
ATTACHMENT SYSTEM FOR PREFABRICATED UNITS

Harold M. King, Jarrettsville Pike, Phoenix, Md.

Continuation-in-part of application Ser. No. 835,106, June 20, 1969. This application Jan. 21, 1970, Ser. No. 4,527
Int. Cl. F16b *3/00*
U.S. Cl. 287—189.35 **9 Claims**

An attachment system for prefabricated construction, such as assembly of panels, posts, trusses, and the like, the system including double-tapered interconnective clips for installation on the respective structures to be secured together, and spacer provisions to tension the clips against each other on engagement, which consists of a vertical-sliding tightening in-

terconnection of the clips. In further embodiments of the invention the spacers are provided as integral parts of the wall

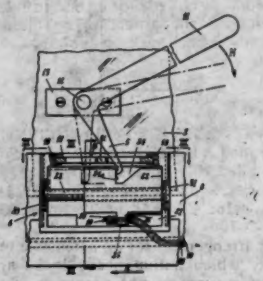


structure by recessing the clips in the wall structure, and various clip extensions are provided to stiffen the clips and to facilitate mounting the clips.

3,589,759
LOCKING DEVICE FOR MOVABLE LEAVES SUCH AS WINDOW PANES

Marcel Bercheux, Meudon-la-Foret, France, assignor to Bouissols Souchon Neuvesel, Paris, France

Continuation-in-part of application Ser. No. 752,993, Aug. 15, 1968, now abandoned. This application Mar. 17, 1969, Ser. No. 807,619
Claims priority, application France, Mar. 26, 1968, 145,355
Int. Cl. E05c *3/06*
U.S. Cl. 292—50 15 Claims



A device for locking movable leaves such as window panes and comprising a main lock provided with a catch mounted on the leaf and adapted to cooperate with a box-staple fixed in oppositely facing relation on the casing against which the leaf is brought to bear in the closed position and at least one auxiliary lock. The device comprises a system for the remote operation of the auxiliary lock by the catch of the main lock by means of a mechanical connection system carried by the casing.

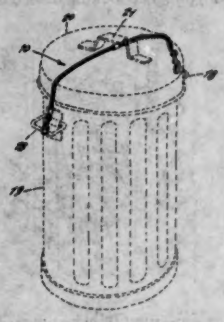
The connection system according to a specific embodiment comprises a slide-block which is housed within the box-staple, said slide-block being connected to motion-transmission means carried by the casing and terminating in a rocking-latch which forms part of the auxiliary lock.

3,589,760
GARBAGE CAN LID CLAMP

Robert F. Williams, 1315 19th Ave., Columbus, Ohio

Filed Aug. 6, 1969, Ser. No. 847,960
Int. Cl. B65d *45/08*; E05c *19/18*
U.S. Cl. 292—258 1 Claim

A tension cord assembly for the purpose of securing a garbage can lid upon a garbage can so to prevent access of stray animals to the garbage within the can, the device comprising a length of nylon cord carrying a spring clamp at one end, the opposite end of the cord being connected through a

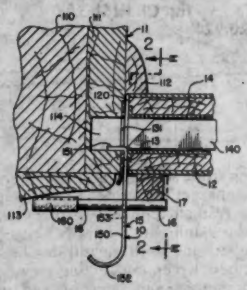


swivel to one end of a steel coil spring, the opposite end of the coil spring being attached to a snaphook.

3,589,761
PORTABLE SAFETY DOOR LOCKS

Edgar A. Lambert, 10005 Cheyenne, Detroit, Mich.

Filed June 8, 1970, Ser. No. 44,009
Int. Cl. E05c *19/18*
U.S. Cl. 292—292 1 Claim



An improved simplified portable safety door lock for hinged doors comprising a lock bar including a flat shank having a door jamb striker plate engaging flange at one end and a finger hook at the other end thereof, the lock bar shank having a plurality of longitudinally spaced apertures therein to accommodate a lock pin therethrough. One end of the lock pin has a rubber sleeve thereover for contacting the door jamb, and the other or free end of the lock pin extends through a selected aperture in the lock bar, and a lock wedge firmly positioned between the inside face of the door and the free end of the lock pin securing the door in its closed position; the portable safety door lock being readily releasable by releasing the wedge and removing the lock pin from the lock bar.

3,589,762
RETRACTING CHAIR

Bror W. Henrikson, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

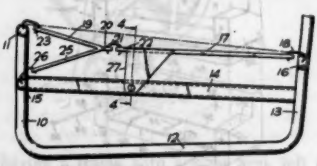
Filed Mar. 19, 1969, Ser. No. 808,438
Int. Cl. A47c *1/12*
U.S. Cl. 297—324 8 Claims

A retracting auditorium chair is provided with a slidably and rotatably mounted seat which has a roller engaging a cross tube connecting the chair standards so that the roller rides upon the upper portion of the tube as the seat is lowered and engages the rear of the tube as the seat is raised.

Connecting means between the seat and back cause the back to move to a vertical position as the seat is raised, and roller

and track means supported by the standard guide the back in this movement.

3,589,763
SEATS
John Vincent Reeves, Stoke, Coventry, England, assignor to Rootes Motors Limited, London, England
Filed Jan. 6, 1969, Ser. No. 789,257
Claims priority, application Great Britain, Jan. 5, 1968, 914/68
Int. Cl. A47c 7/16
U.S. Cl. 297—452 **3 Claims**

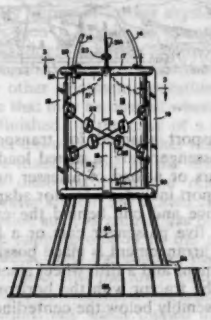


A seat having front and rear crossmembers between which a resilient diaphragm is stretched for supporting a seat cushion and a resilient connecting member secured to the underside of the diaphragm part way between the front and rear crossmembers and to the seat frame below the front and rear crossmembers which connecting member is arranged to hold the diaphragm in a generally concave formation.

3,589,764
CONTAINER CARRIER
Ernest R. Cunningham, Libertyville, and Ronald C. Owen, Harwood Heights, both of, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Jan. 27, 1970, Ser. No. 6,100
Int. Cl. A45j 45/00
U.S. Cl. 294—31.2 **5 Claims**

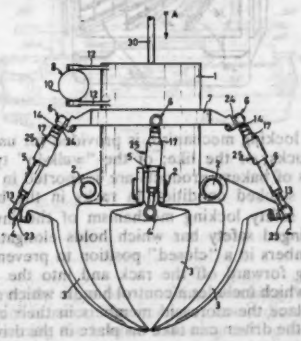
A container carrier formed of plastic sheet material having ends integrally connected to an endless band and extending inwardly therefrom, is formed by blanking handle ends totally within an aperture formed by the endless band. The handle ends extend at an angle to the inner periphery of the endless band thereby allowing the ends to lie parallel to one another within the endless band.

3,589,765
LOAD ATTACHMENT DEVICE
Wesley G. Lematta, 1715 Edgecliff Terrace, Lake Oswego, Oreg.
Filed Apr. 18, 1969, Ser. No. 817,333
Int. Cl. B66c 1/00
U.S. Cl. 294—66 **7 Claims**



A collar is disclosed for attachment about a remotely located article to be lifted. Disposed about the resilient collar are cincture means for reducing the effective diameter of the collar causing gripping contact of the collar with the article upon contraction of the cable means. A guide cone is shown mounted upon the collar's lower end to facilitate placement of the device on the article to be lifted. The device is suspended in a normal open position by a rope prior to load engagement.

3,589,766
ACTUATING DEVICE FOR GRIPPING MEMBERS
Giorgio Bormioli, Via Galilio Galilei, 11 Padova, Italy
Filed May 19, 1969, Ser. No. 825,523
Claims priority, application Italy, May 21, 1968, 16758A/68
Int. Cl. B65d 51/00; B66c 3/00
U.S. Cl. 294—106 **6 Claims**



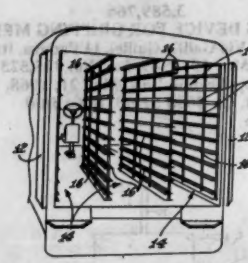
A device for actuating gripping or holding members is disclosed, such as the shells of a grab or the clamping jaws for the cover of a container, in which the members to which the closing or opening operation of the gripping members is entrusted to rods of a resiliently variable length which are hingedly connected, on the one hand, to the supporting member of the gripping members and, on the other hand, to a thrust ring which can be rotated about the supporting member. The thrust ring has an oscillatory movement between two angular

end positions and its angular movement is controlled by a drive member.

3,589,767
VEHICLE TRANSPORT
Gerald W. Stuart, Pontiac, Mich., assignor to Traffic Transport Engineering, Inc., Dearborn, Mich.
Filed Feb. 3, 1969, Ser. No. 795,978
Int. Cl. B60p *3/08*
U.S. Cl. 296—1 **18 Claims**

A vehicle transport adapted for transporting a load of seven full-size passenger cars, a mixed load of seven trucks and passenger cars or a load of a lesser number of trucks. The vehicle transport includes a tractor adapted to carry two vehicles, one above and one behind the cab, and a trailer adapted to carry five passenger cars or a lesser number of trucks. This load arrangement is made possible by a particular track arrangement and a fifth wheel assembly mounted at the rear end of the tractor with the horizontal pivot axis of the fifth wheel assembly below the centerline of the rear axle of the tractor.

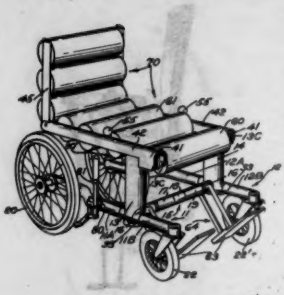
3,589,768
DELIVERY TRUCK TRAY SAFETY LOCKING MECHANISM
James D. Wilson, Long Beach, Calif., assignor to Banner Metals, Inc., Compton, Calif.
Filed June 16, 1969, Ser. No. 833,542
Int. Cl. B62d *33/08*
U.S. Cl. 296—24 **5 Claims**



A safety locking mechanism is provided for use in bakery delivery trucks, or the like, of the "walk-in" type; and in which trays of bakery products are supported in a generally horizontal, stacked condition in racks in the back of the truck. The safety locking mechanism of the invention includes a hinged safety bar which holds elongated vertical hinged members in a "closed" position to prevent the trays from sliding forward off the rack and into the cab of the truck, and which includes a control handle which must be actuated to place the aforesaid members in their closed position before the driven can take his place in the driver's seat.

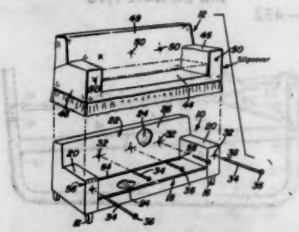
3,589,769
STANDING WHEELCHAIR
Peter W. Bressler, 11 N. Derby Ave., Ventnor, N.J.
Filed May 19, 1969, Ser. No. 825,639
Int. Cl. A47g *5/00*
U.S. Cl. 297—42 **8 Claims**

A wheelchair for lifting a person paralyzed from the midthorasic region down is provided which consists of a wheeled framework mounting parallel rod frame coupled to a seatback frame, the seat frame being actuated by a spring motor which straightens the seat and seatback to a position



10° less than vertical to provide standing support for the paralyzed person.

3,589,770
FURNITURE WITH CHANGEABLE COVERS
Charlotte S. Kelley, 429 N. 5th St., Vandalia, Ill.
Filed Apr. 17, 1969, Ser. No. 817,131
Int. Cl. A47c *27/00, 31/00*
U.S. Cl. 297—218 **9 Claims**



A self-contained couch wherein a leg-supported upholstered frame provides a sturdy seat, arms at the respective ends thereof and an upstanding tufted backrest. The frame is enclosed within the snug-fitting confines of unfinished but coverable wear-resisting material such as, for example, ticking, burlap, denim, canvas or the like. The seat, arms and backrest are expressly constructed to provide foundation for a unique slipcover having distributively arranged built-in eyelets and attached holddown hooks which are detachably connectable with an oriented elastic anchoring cord stitched on the rear of the seat portion of the couch. The readily applicable and removable slipcover—fabricated from selectively colorful upholstering materials—permits one to selectively vary the outward appearance easily, quickly and at will and in keeping with the tradition of a special occasion, if so desired.

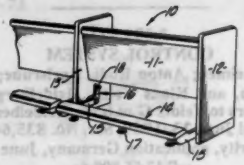
ERRATA

For Classes 297—324 and 297—452 see:
Patent Nos. 3,589,762 and 3,589,763

3,589,771
SELF-ALIGNING PIVOT SUPPORT FOR CHURCH KNEELER
Horace E. Harris, 2916 N. Buena Vista St., Burbank, Calif.
Filed May 19, 1969, Ser. No. 825,483
Int. Cl. A47c *9/14*; E05f *1/14*
U.S. Cl. 297—426 **15 Claims**

A self-aligning pivot support for church kneelers and like devices in which spaced supporting arms are pivotally mounted for swinging movement on the end and intermediate pew supports. The pivot member is mounted on a

supporting bracket structure so as to have universal movements which permit of automatic compensation for slight variations and departures with respect to mounting surfaces

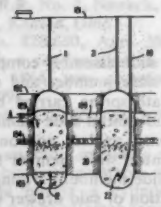


and spacing dimensions, a spring operating to urge the pivot member towards a normal position, and resiliently oppose tilting as well as limited axial movement of the pivot member.

3,589,772
CHAIR
Gardner Leaver, New York, N.Y., assignor to Steelcase, Inc., Grand Rapids, Mich.
Filed Jan. 23, 1969, Ser. No. 793,373
Int. Cl. A47c *7/00, 7/14*
U.S. Cl. 297—445 **7 Claims**

A chair having a frame with a right arm, left arm, seat cross support member, and a back cross support member, said frame being mounted on a U-shaped support member having two legs extending upwardly, each of the legs being connected to one of the arms of the frame; and a seat assembly having seat and back portions mounted on said frame, the seat portion being connected to the seat cross support member and the back being connected to the back cross support member.

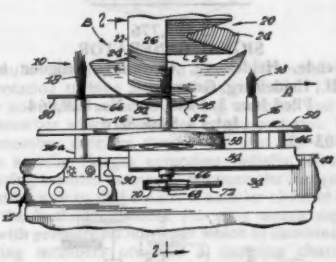
3,589,773
MANAGEMENT OF UNDERGROUND WATER PROBLEMS
Rod P. Dixon, Salt Lake City, Utah, assignor to American Oil Shale Corporation, Salt Lake City, Utah
Continuation-in-part of application Ser. No. 615,444, Feb. 13, 1967, and a continuation-in-part of 681,146, Nov. 7, 1967.
This application June 5, 1968, Ser. No. 734,661
Int. Cl. E21b *42/28;* **E02b** *11/00*
U.S. Cl. 299—4 **1 Claim**



The detonation of a large size nuclear device in a geological formation is used to prevent or minimize flooding of working areas such as conventional mines or nuclearly created chimneys of broken rock from which valuable minerals are to be recovered.

For instance, the preliminary detonation of a large size nuclear device underneath a subterranean aquifer upstream from a mineral zone which is to be mined in a conventional manner or processed after shattering by nuclear detonation will create an underground water storage reservoir into which the aquifer can drain. This prevents such aquifer from being tapped and drained into the mine or nuclearly detonated chimney which contains the mineral being exploited. The mineral zone when shattered downstream by a nuclear detonation can then be exploited in place by retorting or other treatment, eventually allowing the water to drain into the retorted cavity created by the second detonation, and by progressively setting of further shattering detonations downstream from such a previously created underground reservoir and repeating whatever treatment may be appropriate. By storing the water in the upstream nuclear cavity during burning or other treatment operation it is conserved for any further use that may be desired when the retorting or treating phase is finished. In the case of a mineral such as shale, the nahcolite, dawsonite, and other minerals which are present therein are made soluble by the retorting operation and can then be dissolved from the remaining mineral residue when the water level in the treated chimney is raised. In a mineral formation such as natural gas or oil where there is an impermeable capping on top of the production zone with a contained water zone thereabove, the nuclear device is placed at a point such that the lower part of the chimney created by the nuclear detonation is much below the production zone. This permits any water tapped in from above to drain into the lower part of the chimney without interfering with normal gas or oil production.

3,589,774
TRIMMING STATION FOR BRUSHMAKING MACHINE
Harold J. Hazelton, Batavia, Ill., assignor to Carlson Tool & Machine Co.
Filed Aug. 13, 1969, Ser. No. 849,844
Int. Cl. A46d *9/02*
U.S. Cl. 300—17 **10 Claims**



An improvement in a brushmaking machine for making artist-type paint brushes. The improvement is directed to the means for trimming the bristles following tufting thereof into a ferrule and includes structure at a bristle-trimming station for grasping the tufted ferrules and rotating the same about the longitudinal axis of the ferrules while the tufts thereof are subjected to a trimming blade for finishing the ends of all the bristles thereby.

ERRATUM

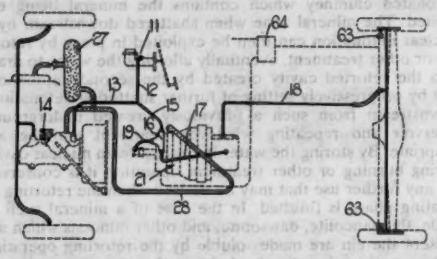
For Class 301—63 see:
Patent No. 3,589,149

3,589,775

BRAKING SYSTEMS FOR VEHICLES

Stuart B. Dawson, Shirley, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed May 13, 1969, Ser. No. 824,134
Claims priority, application Great Britain, May 22, 1968, 24,403/68
Int. Cl. B60t 8/08, 13/60
U.S. Cl. 303—21 6 Claims



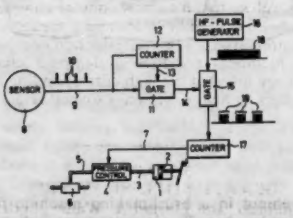
A braking system for a vehicle includes a manually operable device for supplying hydraulic fluid under pressure. The device is connected by an hydraulic line to brake mechanisms of the vehicle so that operation of the device causes operation of the brake mechanisms. There is provided a vacuum operable servomechanism which is capable of supplying hydraulic fluid under pressure to the brake mechanisms and pressure-sensitive means operable when the pressure generated by the manually operable device exceeds a first predetermined value for braking the hydraulic line from the device and initiating operation of the servomechanism. The system further includes control means associated with the servomechanism and the manually operable device for controlling operation of the servomechanism in accordance with operation of the manually operable device, and further means responsive to the pressure in the vacuum supply line of the servomechanism for reestablishing the hydraulic line from the manually operable device to the brake mechanisms when the pressure in the vacuum line exceeds a second predetermined value, for example in the event of failure of the vacuum source.

3,589,776

SIGNAL GENERATOR

Heinz Wehde, Heidelberg, Germany, assignor to Teldix G.m.b.H., Heidelberg, Germany

Filed June 3, 1969, Ser. No. 829,864
Int. Cl. B60t 8/16
U.S. Cl. 303—21 3 Claims



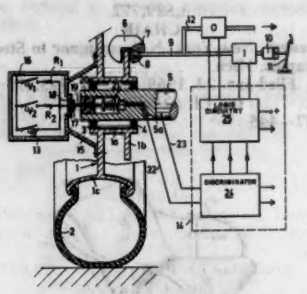
A vehicle brake system is provided with mechanism to prevent locking of the vehicle wheels during brake application so that not only will the directional stability of the vehicle be retained but also the braking effort will be more efficient. The wheel-associated signal generators are of the small size and may be directly attached to the vehicle wheels and incorporate freely rotatable inertial masses employing inductive or capacitive elements which allow acceleration and deceleration forces to be detected without the utilization of electrical contacts. The freely rotatable inertial mass is damped in accord and as a function of the rotational speed of the wheel. The spacing between the pulses emitted by the signal generator is detected by a control arrangement which produces a control signal to actuate the pressure control means of the break system if the spacing between adjacent pulses is shorter than a predetermined minimum value.

3,589,777

CONTROL SYSTEM

Heinz Leiber, Leimen; Anton Rodi, Karlsruhe; Helmut Will, Leutershausen, and Klaus Voigt, Heidelberg, all of, Germany, assignors to Teldix G.m.b.H., Heidelberg, Germany

Filed June 23, 1969, Ser. No. 835,646
Claims priority, application Germany, June 25, 1968, P 17 55 808.6
Int. Cl. B60t 8/12
U.S. Cl. 303—21 BE 10 Claims



An antilocking system for vehicle brakes includes a wheel sensor having plural contacts for controlling the system. The contacts are connected in parallel and have different resistance values associated with them so that different signals are produced when the contacts are closed individually and together. A minimum number of common conductors is used to conduct these signals from the rotating wheel sensor to the vehicle-mounted control circuit. The control circuit includes switches responsive to the various signals and logic circuitry associated with the switches to control the fluid valves of the braking system.

3,589,778

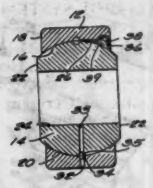
CABINET DRAWER SLIDE ASSEMBLY

Warren J. Olson, Mahtomedi, Minn., assignor to Huot Manufacturing Co., St. Paul, Minn.

Filed Feb. 24, 1970, Ser. No. 13,340
Int. Cl. F16c 29/00
U.S. Cl. 308—3.6 5 Claims

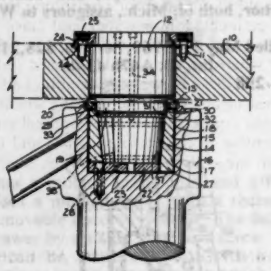
A cabinet drawer slide assembly comprising a drawer slide member, a central slide member and a cabinet supported slide member, a plate spring carried by said drawer slide member adjacent said central slide member, said plate spring having a longitudinal angled portion projecting in the direction of said central slide member forming a stop abutment, said central slide member carrying a stop member extending in the direction of said drawer slide and engageable by said stop abutment, said plate spring having an unobstructed portion extending forwardly and outwardly of said central slide member yielding to finger pressure for disengagement thereof from said stop member.

3,589,779
SEALED LOADER SLOT BEARING
Ned L. Sokol, Van Nuys, Calif., assignor to Rex Chainbelt Inc., Milwaukee, Wis.
Filed Nov. 24, 1969, Ser. No. 879,308
Int. Cl. F16c *11/06*
U.S. Cl. 308—72 9 Claims



The loader slots machined in the outer race of a spherical bearing to facilitate insertion of the bearing inner race are sealed after assembly of the bearing by filling them with a metallic material. The loader slots are provided with recessed portions which are filled by the metallic sealing material in a manner such that the hardened material is keyed against displacement by radial or thrust forces or bearing rotation.

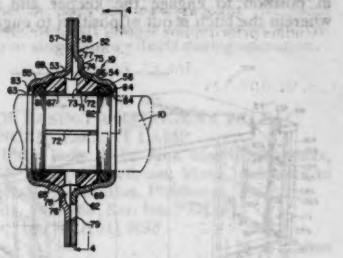
3,589,780
BEARINGS
Joseph Arthur Thompson, Chawn Hill, Stourbridge, England, assignor to G.K.N. Engineering Limited, Wolverhampton, England
Filed May 13, 1969, Ser. No. 824,052
Int. Cl. F16c *1/24*
U.S. Cl. 308—122 6 Claims



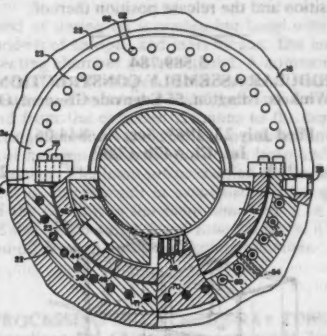
A bearing which includes an inner member having an externally coned portion, an outer member, a sleeve located between the coned portion and the outer member, the sleeve having an internal coned surface, corresponding to the surface of the coned portion and the sleeve being urged into engagement with the coned portion by fluid pressure to provide automatic adjustment for radial wear.

3,589,781
BRAKE CAMSHAFT MOUNTING
William G. Hanley, R.R. No. 4, Newark, Ohio, and Frank H. Fisher, R.R. No. 1, Kenton, Ohio
Division of Ser. No. 820,680, Apr. 30, 1969, Patent No. 3,497,275, which is a continuation of application Ser. No. 558,755, June 20, 1966, now abandoned. Filed July 30, 1969, Ser. No. 846,092
Int. Cl. F16c *1/24, 9/06*
U.S. Cl. 308—36.1 14 Claims

A brake camshaft assembly including a shaft and a pair of axially spaced-apart bushings rotatably supporting the shaft, one of the bushings having a cylindrical outer surface rotatably received in a first retainer secured in a fixed position relative to a first support member and the other bushing having a spherical outer surface rotatably received within a second retainer secured to a second support member in a normally fixed position, the normally fixed position of the second retainer being selectively adjustably relative to the second support member to permit proper axial alignment of the bushings for free rotation of the shaft.



3,589,782
DAMPER BEARING TO INCREASE ROTOR STABILITY
Albert F. Le Breton, Media; Ronald E. Warner, Media, and Albert A. Raimondi, Monroeville, all of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 18, 1969, Ser. No. 859,017
Int. Cl. F16c *1/24*
U.S. Cl. 308—122 9 Claims

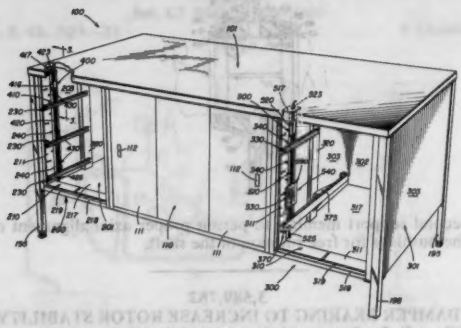


An annular bearing structure which minimizes vibrations from a rotating turbine shaft at the pedestal. The bearing structure comprises an inner bearing member and an outer bearing member which is secured to the pedestal. The inner bearing member receives the journal and has on opposite ends two annular flanges extending radially outward. The outer bearing member is spaced between the flanges and the inner bearing wall so that a narrow annular channel is formed between the bearing members. Pumping means supplies the channel with pressurized lubricant which in combination with the bearing members provides a damping characteristic. Resilient bars are inserted through corresponding holes in the bearing members to help maintain a spaced relation between the bearing members.

3,589,783
DRAWER-LOCKING SYSTEM
Robert A. Studinski, and Florian A. Walter, both of Aurora, Ill., assignors to Lyon Metal Products Incorporated, Aurora, Ill.
Filed Oct. 31, 1968, Ser. No. 772,155
Int. Cl. E05b *65/46*
U.S. Cl. 312—217 27 Claims

There is disclosed herein a drawer-locking system for use in a cabinetlike body having drawer support structure therein, with at least one drawer being mounted in the body on the support structure for movement inwardly and outwardly with respect thereto and having a keeper thereon. Lock mechanism is carried by the drawer and is movable between a locked position and an unlocked position. A cable

extends through the body adjacent to the drawer and has one end movably mounted with respect to the body. A latch is mounted on the cable adjacent to the drawer and is movable with the cable between a locking position wherein the latch is in position to engage the keeper and a release position wherein the latch is out of position to engage the keeper, the lock mechanism being operable to move the latch between the locking and release positions thereof, whereby movement of the lock mechanism between the locked position and the unlocked position thereof moves the latch between the locking position and the release position thereof.

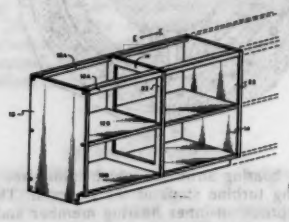


3,589,784

MODULAR ASSEMBLY CONSTRUCTION

Willhelm Winkels, Islington, 55 Edenvale Crescent, Ontario, Canada

Filed July 23, 1969, Ser. No. 844,061
Int. Cl. A47b *47/00*
U.S. Cl. 312—263 **20 Claims**



A modular assembly extendible in one direction uses first members extending in such direction and second members perpendicular thereto, where a rod extends through a bore in a first member to allow second members to be clamped to each end thereof in a manner preventing translation or rotation of a second member relative to a first.

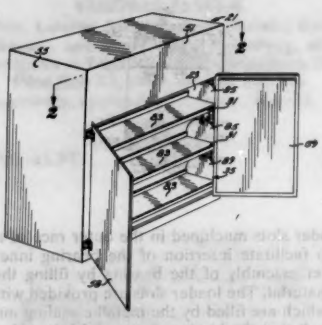
3,589,785

SHELF CONVEYOR APPARATUS

Geraldine McGeer Appleby, 392 Wisteria Ave. S., Las Vegas, Nev. 89106

Filed Oct. 9, 1969, Ser. No. 865,013
Int. Cl. H02k *1/22*; B65g *19/00*
U.S. Cl. 312—268 **7 Claims**

A shelf conveyor apparatus for use with a kitchen cabinet formed with an access opening in its front wall and adapted for storage of a plurality of various height articles. The apparatus includes a vertically disposed endless conveyor means for disposition in said cabinet and including a series of connectors spaced therealong. A plurality of shelves are provided with hangers for interchangeable connection with the respective connectors whereby the hangers of certain shelves may be connected with connectors spaced at predetermined distances to space such certain shelves apart for convenient receipt therebetween of articles of one height and the hangers of other shelves may be connected with connectors spaced apart at different distances to space such other hangers apart for convenient receipt therebetween of articles of another height. Thus the conveyor means may be operated to selectively advance selected ones of the shelves into registration with the access opening for convenient viewing of the articles stored thereon and for ready access to such articles. The shelves may be substantially narrower than conventional kitchen cabinet shelves while still utilizing the entire depth of a conventional cabinet thereby eliminating the inconvenience of having certain of the articles stored at the back of a relatively deep shelf and making it difficult to view such articles from the front of the shelf and necessitating reaching and groping over and between articles disposed at the front of the shelf to acquire such articles located at the rear of the shelf.

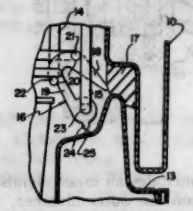


3,589,786

DISHWASHER RACK

William T. Lampman, St. Joseph, and Charles H. Wade, Benton Harbor, both of, Mich., assignors to Whirlpool Corporation

Filed May 27, 1969, Ser. No. 828,218
Int. Cl. A47b *43/00*
U.S. Cl. 312—298 **8 Claims**



A dishwasher having movable racks for holding the dishes during the washing thereof together with yieldable means located between the rack and an access door for insuring that the rack is always in proper position when the door is closed.

3,589,787

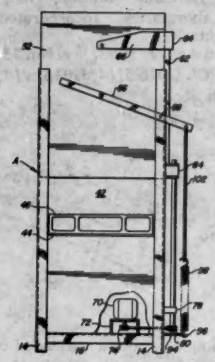
DISHWASHER DOOR OPERATOR

Eugene Messersmith, Tampa, Fla., assignor to Alco Standard Corporation, Cleveland, Ohio

Filed Nov. 12, 1969, Ser. No. 875,897
Int. Cl. A47b *88/00*
U.S. Cl. 312—319 **10 Claims**

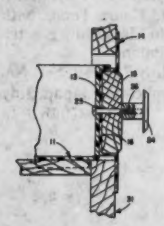
A dishwasher having a washing chamber includes a vertically slidable door for selectively opening and closing the washing chamber. A shaft is positioned on the dishwasher for rotation on a vertical axis. A linear actuator positioned on the shaft moves linearly along the shaft when the shaft is rotated. The linear actuator is connected with the door so that movement of the actuator is imparted to the door. A reversible drive motor selectively rotates the shaft in first and second opposite directions to selectively move the linear ac-

tuator up and down the shaft and effect opening and closing of the door. Automatic control is provided to effect auto-



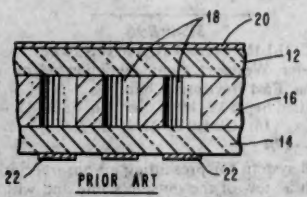
matic opening of the door at the end of a washing cycle in the dishwasher.

3,589,788
DRAWER FACING DEVICE
Stuart J. Kaiden, 10182 John Day Drive, Huntington Beach, Calif. 92646
Filed Feb. 13, 1970, Ser. No. 11,155
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 3 Claims



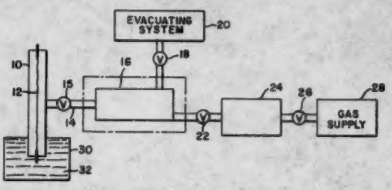
A drawer has a molded plastic pan and a facing device which comprises a molded frame with a recess therein for receiving a removable decorative block. The facing device is held to the drawer by a single knob and screw. As such, the drawer front can be made available with a selection of decorative blocks to match the cabinet in which the drawer is to be installed.

3,589,789
METHOD OF PRODUCING AN OPEN CELL COLOR PLASMA DISPLAY DEVICE
Carl R. Hubert, Saugerties; George M. Krembs, Hyde Park, and Parviz Soltan, Poughkeepsie, all of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 22, 1968, Ser. No. 778,159
Int. Cl. H01j *9/18, 9/38*
U.S. Cl. 316—19 2 Claims



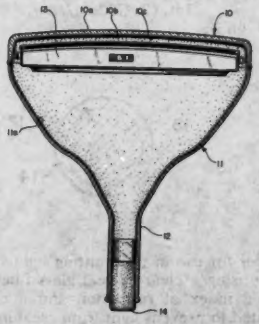
Color plasma display panels are produced by selectively applying, by cataphoretic deposition, predetermined phosphors to certain conductors carried on the inner faces of panel walls, and other phosphors to other conductors. The panel walls are positioned in spaced-apart relationship with the conductors in mutually orthogonal relationship, and a gas chamber formed that includes the inner faces of the panel walls. The cells of the resultant plasma display panel will exhibit either multiple or single color effects during operation.

3,589,790
METHOD OF BASING A HALOGEN CYCLE INCANDESCENT LAMP
Francis A. Beane, Little Falls, N.J.; Jack Martin, Paramus, N.J., and James J. Palermo, Methuen, Mass., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 13, 1968, Ser. No. 775,357
Int. Cl. H01j *9/38*
U.S. Cl. 316—20 8 Claims



A method of dosing an incandescent lamp with predetermined amounts of halogen and inert fill gas. The lamp and an interconnecting chamber are evacuated. A common chamber contains a mixture of halogen and inert gas at predetermined partial pressures. The halogen and fill gas are simultaneously transported from the common chamber to the lamp and interconnecting chamber to establish predetermined partial pressures of halogen and inert gas in the lamp and interconnecting chamber. The lamp is then cooled below the condensation point of the halogen to condense the halogen in the lamp, and the cooling of the lamp also causes an increased amount of the fill gas to be dosed into the lamp. The lamp is then sealed off from the interconnecting chamber.

3,589,791
PROCESSING OF CATHODE-RAY TUBES
John A. Kanellopoulos, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Sept. 2, 1969, Ser. No. 856,248
Int. Cl. H01j *9/38*
U.S. Cl. 316—24 13 Claims



The envelope of a color picture tube has a faceplate section and a funnel section. While they are separated from one another, the faceplate is screened, aluminized and then baked at a high temperature. A frit material is coated on the meeting surfaces of the faceplate and funnel sections after which the envelope is subjected to another high temperature heat treatment to unite these envelope sections. The en-

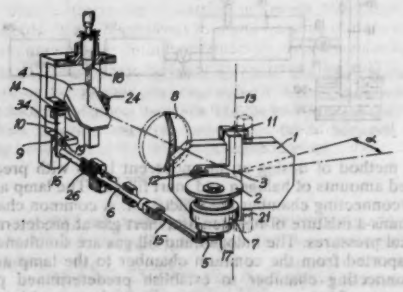
velope is then transported, neck facing downwardly, to a gun sealing station, where it is to receive a gun assembly and a sponge, that has been saturated with water, is inserted into the mouth of the neck as the envelope leaves the frit sealing station. In its traverse to the gun sealing station, the envelope draws air in through the sponge, injecting water vapor into the envelope.

3,589,792

OSCILLATING DEVICE FOR SWIVEL-MOUNTED MIRROR

Georg Kurotschka, Karlsruhe, and Klaus Speckis, Eppelheim, both of, Germany, assignors to Eltro GmbH & Co., Heidelberg, Germany

Filed Oct. 17, 1969, Ser. No. 867,235
Claims priority, application Germany, Oct. 17, 1968, P 18 03 608.3
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **8 Claims**



A device for the production of sharply limited oscillations of a swivel-mounted mirror, especially for opto-electronic scanners comprises a crank drive, whose pushrod incorporates a flexible drag link. The oscillating movements of the mirror are limited by abutments in which deviations of the deflections of the mirror from the stroke of the crank drive are permitted by the presence of the flexible drag link.

3,589,793

GLASS FIBER OPTICAL DEVICES

Lawrence E. Curtiss, Ann Arbor, Mich., assignor to Basil I. Hirschowitz and Wilbur Peters, both of Ann Arbor, Mich., part interest to each

Filed May 6, 1957, Ser. No. 657,325
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B **8 Claims**

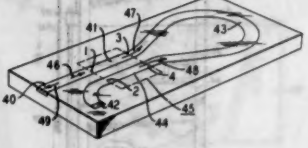
A glass fiber for use in transmitting light from end-to-end thereof comprising a clear optical glass fiber core having a predetermined index of refraction and a continuous glass coating adapted to prevent light from escaping from the core into the coating, the coating being fused to the entire outer surface of the core from end-to-end thereof and having an index of refraction which is lower than that of the core. A plurality of these fibers made up in side-by-side ordered relation form a light or an image transmitting device. The glass coating on each core preferably has a higher softening temperature than that of the core. In addition, the fibers are extremely fine in size, such as up to about 0.0002 inch thick.

3,589,794

OPTICAL CIRCUITS

Enrique A. J. Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 7, 1968, Ser. No. 750,816
Int. Cl. G02b *5/14*; H01p *5/14, 7/06*
U.S. Cl. 350—96 **18 Claims**



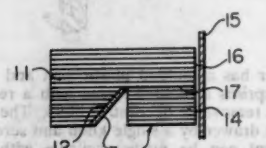
This application describes a variety of circuit components for use at optical frequencies. Each of the components is formed from one or more transparent dielectric strips embedded in a transparent substrate of slightly lower refractive index. By suitably shaping and locating the guiding strips, power dividers, modulators, directional couplers, and a variety of filters can be realized. Tuning arrangements are also disclosed.

3,589,795

FIBER OPTICS ELEMENT WITH OBLIQUE INTERNAL REFLECTOR MEANS

Eiichi Miyazaki, and Kaoru Tomii, both of Kadoma, Osaka, Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

Filed July 7, 1969, Ser. No. 839,155
Claims priority, application Japan, July 10, 1968, 43-49,270
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B **4 Claims**



A fiber optics element for picking up light reflected by a subject copy which is disposed closely adjacent to the one face thereof, said fiber optics element comprising a first fiber plate formed of a plurality of optical fibers through which the incoming light is conducted to said subject copy, a second fiber plate formed of like optical fibers through which the light reflected by said subject copy is conducted in a direction different from that of said incoming light and a reflector means for reflecting said light conducted by said second fiber plate to provide a light output modulated by said subject copy.

3,589,796

COLLIMATED VIEWING SYSTEM

Carl F. Schaefer, Westport, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 19, 1966, Ser. No. 580,381
Int. Cl. G02b *23/10, 27/10*
U.S. Cl. 350—174 **7 Claims**

An optical system for presenting an observer at a viewing position with a view of the outside scene and with a view of an image of an interior scene in which an image combiner mounted between the viewing position and the outside scene forms a negative lens and a positive mirror with relation to a

cathode-ray tube phosphor, for example, located below the combiner axis to provide an observer with an aplanatic image of the phosphor. An astigmatic element is disposed between the phosphor and the combiner for correcting the phosphor

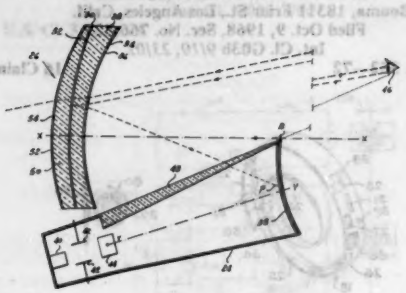


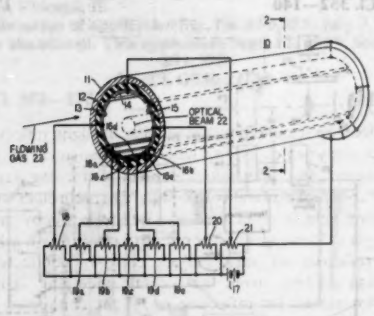
image for astigmatism. The combiner body comprises a portion spaced outwardly from the partially reflecting surface-forming mirror to compensate for the lens effect of the rest of the combiner on the image of the outside scene.

3,589,797

GAS LENS FOR OPTICAL TRANSMISSION, WITH VERTICAL GRADIENT HEATING TO REDUCE ABERRATIONS

Stewart E. Miller, Locust, and William H. Steier, Middletown, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights

Filed Aug. 15, 1968, Ser. No. 752,811
Int. Cl. G02b *3/12, 5/14*
U.S. Cl. 350—179 **11 Claims**



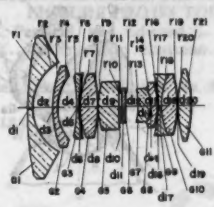
A gas lens having a radial refractive index gradient in a horizontal conduit suffers from an optical aberration due to the fact that the vertical centers of gravity of different vertical chords of gas are displaced downward due to gravity by different amounts, depending upon the horizontal distance of the chords from the center of the conduit. This aberration is minimized by the provision of means for angular gradient heating at a plurality of locations along a lower portion and/or upper portion of the conduit, thereby inducing an upward convection force in the gas to oppose the aforementioned varying gravity-induced downward displacement of the gas.

3,589,798

WIDE-ANGLE LENS SYSTEM WITH CORRECTED LATERAL ABERRATION

Toshinobu Ogura, Sakai-shi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1969, Ser. No. 810,096
Claims priority, application Japan, Mar. 25, 1968, 43/19328
Int. Cl. G02b *13/00, 9/00*
U.S. Cl. 350—198 **3 Claims**



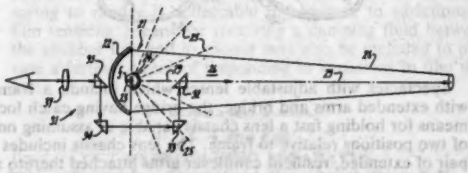
The present invention relates to an extreme wide angle lens system having an angle of coverage of 180° which comprises eleven lens elements including an interchangeable filter. This improved extreme wide angle lens system with sufficient light intensity has a relative aperture of up to F/2.8 with a comparatively small number of compact lens elements and the lateral aberration as well as various aberrations thereof are greatly corrected.

3,589,799

OPTICAL SYSTEM FOR ILLUMINATION AND VIEWING OF AN AREA

John E. Hotchkiss, Corte Madera, Calif., assignor to Hotchkiss Instruments, Inc.

Filed Feb. 5, 1969, Ser. No. 796,875
Int. Cl. G02b *27/02*
U.S. Cl. 350—237 **4 Claims**



An optical system for the concomitant illumination and viewing of recessed areas which is particularly suited for incorporation into an endoscope is disclosed. The optical viewing system is preferably formed for coincident illumination and viewing by the placement of a reflective viewing surface on the focal axis of an illuminating beam between the light source and the area to be viewed. Additionally, a reflective viewing system is preferably provided which achieves the visual sensation of "looking through" the light beam producing illuminating system and down the focal axis of the beam. Additionally, a pair of reflective surfaces is employed to achieve binocular viewing. Illumination of the viewing area is preferably achieved by an illumination system which includes a beam-reinforcing reflector means, which directs substantially all of the light into a focused illuminating beam and thereby intensifies the beam.

3,589,800

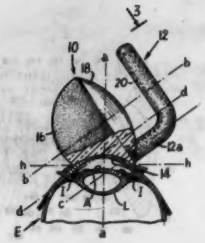
GONIOSCOPIC LENS

Hernando Cardona, 600 West 115th St., New York, N.Y.

Filed June 5, 1969, Ser. No. 830,640
Int. Cl. A61b *3/10;* **G02b** *5/14, 27/02*
U.S. Cl. 351—16 **9 Claims**

A gonioscope for viewing the angle of the anterior chamber of an eye comprises a lens having a concave surface

closely matching the surface of the cornea of the eye and adapted to be positioned in engagement with the cornea in use with the axis of the concave surface substantially coincident with the axis of the eye and a convex spherical lens surface having an axis that intersects the axis of the concave surface at an angle of substantially 55°. Associated with the



lens is a light-conducting fiber cable that is joined to the spherical lens surface at a point spaced from the axis of the convex surface, the light-conducting fiber cable being oriented and positioned so as to direct light toward a place in the angle radially inward of the zone of the angle being observed.

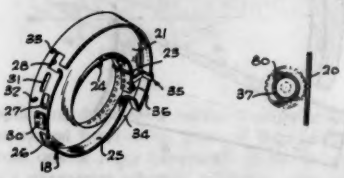
3,589,801
SPECTACLES WITH ADJUSTABLE LENSES
Alan A. Masucci, 1910 University Ave., New York, N.Y.
Filed Oct. 13, 1969, Ser. No. 865,871
Int. Cl. G02c *7/06*
U.S. Cl. 351—55 **2 Claims**

Spectacles with adjustable lenses which include a frame with extended arms and bridge, the bridge having catch lock means for holding fast a lens chassis capable of assuming one of two positions relative to frame. The lens chassis includes a pair of extended, resilient cantilever arms attached thereto at one extremity, the other extremity being attached to the frame, so that the combination becomes a pair of spectacles. The lens chassis permits one viewing area of the lens to be exposed when not in locked engagement with the frame at the catch lock, and another viewing area of the lens to be exposed when the catch lock is engaged.

3,589,802
OPHTHALMIC MOUNTING
Edmund Amaru, 7618 S. Placid St., Las Vegas, Nev.
Filed Sept. 13, 1968, Ser. No. 759,747
Int. Cl. G02c *1/08*
U.S. Cl. 351—90 **2 Claims**

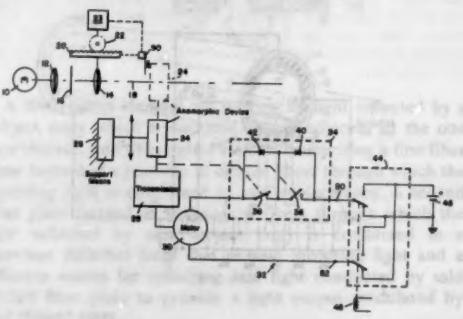
This invention relates to split-rim ophthalmic mountings or split-rim eyeglass frames with particular means for quickly changing lenses, without the use of additional tools. The inventive ophthalmic mountings with a pleasing appearance is particularly functional in allowing the lenses to be readily removed and changed for another or, in the alternative, allows the use of the lenses in another set of mountings.

3,589,803
CONTINUOUS FILM PROJECTOR
Wikke Bouma, 18311 Friar St., Los Angeles, Calif.
Filed Oct. 9, 1968, Ser. No. 766,223
Int. Cl. G03b *9/10, 23/02*
U.S. Cl. 352—72 **16 Claims**



A projector is disclosed herein having a detachable cartridge for storing a continuous loop of motion picture film formed with sprocket holes and having means for removing the film from the outer loop of the film roll and guiding a portion thereof along a predetermined film-projecting path for return to the inner loop of the film roll. Light is projected through a lens system and through the film portion moving along the film-projecting path to establish an optical image projecting axis substantially normal to the film-projecting path. A shutter mechanism adapted to interrupt the optical axis and a film advancement mechanism adapted to move the film loop are driven by a common drive mechanism employing an electric motor powered by storage batteries.

3,589,804
LENS-CHANGING SYSTEM
John K. Taillon, Sierra Madre, and Lonial D. Boen, Pasadena, both of, Calif., assignors to Bell & Howell Company, Chicago, Ill.
Filed July 2, 1969, Ser. No. 838,391
Int. Cl. G03b *3/00*
U.S. Cl. 352—140 **17 Claims**



Remotely controllable apparatus in combination with a projector, for permitting projection of screen images from either optically uncompressed or anamorphic film images. An anamorphic optical device is pivotally secured to support means which in turn is pivotally secured to the projector and rigidly securable thereto for supporting the anamorphic device in a first position outside the projector's optical path and alternatively in a second position in the optical path. Controllably actuable transport means is provided for pivotally transporting the anamorphic device from the first to the second position upon a remote actuation and alternative-

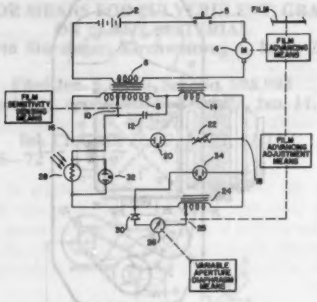
ly from the second to the first position upon another remote actuation.

3,589,805

AC EXPOSURE CONTROL DEVICE FOR A CAMERA

Allen G. Stimson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 29, 1969, Ser. No. 828,994
Int. Cl. G03b 1/60
U.S. Cl. 352—171 4 Claims



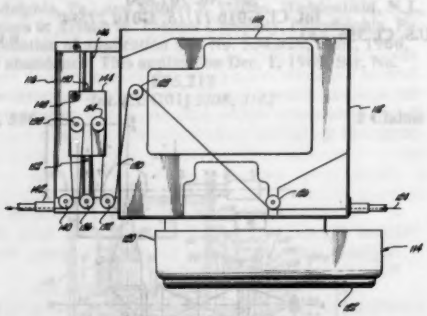
An exposure control apparatus is disclosed which includes a source of DC potential; means coupled to the DC source for producing an alternating voltage; a first signal lamp coupled to the alternating voltage producing means and adapted to indicate whether or not the DC potential is above a selected level; photosensitive means having an electrical parameter that varies inversely with the intensity of viewed scene light; and a second signal lamp operatively coupled to the alternating voltage producing means and the photosensitive means and adapted to indicate if scene illumination is sufficient to expose film.

3,589,806

CONTROL SYSTEM FOR PLURAL MOTION-PICTURE PROJECTORS OPERATING FROM A SINGLE FILM STRIP

Arthur Rak, Altadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of application Ser. No. 650,855, July 3, 1967, now abandoned. This application Sept. 17, 1969, Ser. No. 871,393
Int. Cl. G03b 21/00
U.S. Cl. 352—133 14 Claims



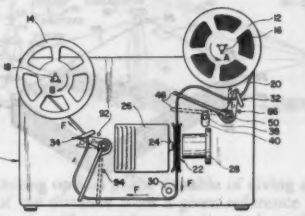
A control system for a plurality of motion-picture projectors operating sequentially on a single strand of film. The system includes a mechanism for forming and monitoring a film loop of a predetermined length at each projection station. As the loop length increases and decreases by a predetermined amount, the system automatically compensates for such changes by interrupting power to one or more of the plurality of projector motors while the remainder of the system attempts to restore itself to normal operation. In the event of a failure of a particular projection station, means are provided for bypassing that station and for disabling portions of the control system to compensate for the missing projector.

3,589,807

FILM SNUBBER FOR A SPROCKETLESS MOTION-PICTURE PROJECTOR

Peter Andrews, Penfield, and Edward S. McKee, Rochester, both of, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1969, Ser. No. 802,784
Int. Cl. G03b 1/54
U.S. Cl. 352—185 13 Claims



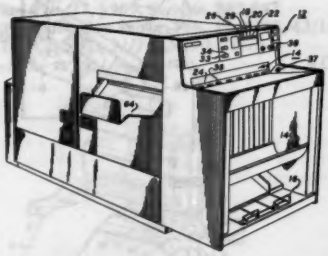
A film snubber is provided for filtering out mechanical disturbances in the film-feeding system of a motion-picture projector and for actuating the projector rewind cycle. The snubber comprises a pair of angularly spaced arms extending radially outwardly from a hub that is pivotally mounted on the projector. A light torsion spring biases the snubber toward the portion of film extending between the film supply reel and the film projection gate so that the angularly spaced arms engage the film. The snubber is thus able to fluctuate freely, under the influence of the torsion spring, in response to variations in tension of the film engaged by the two arms, one of the arms so engaged may be formed as a resilient leaf spring to render it deflectable in response to variations in film tensions. Means for receiving a damping fluid between the snubber hub and its mount may also be included to provide a further means of responding to variations in film tension.

3,589,808

REPRODUCING APPARATUS

George D. Del Vecchio, Briscoe Cove, North Rose, N.Y., assignor to Xerox Croporation, Rochester, N.Y.

Filed June 2, 1969, Ser. No. 829,606
Int. Cl. G03g 15/00
U.S. Cl. 355—3 6 Claims



A continuous and automatic xerographic reproducing machine operable in any of several modes. The machine is adapted to create copy on sheet material of either of two sizes. A sheet-conveying assembly then selectively directs the copy through the machine to an enlarged catch tray at a first output end remote from the sheet input end. In the alterna-

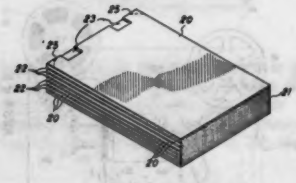
tive, the sheet material may be conveyed along an alternate path to a smaller catch tray at a second output end on a side of the machine remote from the first output end and the sheet input end.

3,589,809

FEEDING SYSTEM

Thomas B. Barker, Webster; Bruce D. MacLellan, Webster, and Casimir J. Mytych, Penfield, all of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 598,279, Dec. 1, 1966, Pat. No. 3,519,124.
Filed May 22, 1969, Ser. No. 851,115
Int. Cl. G03g *13/00*
U.S. Cl. 355—17 7 Claims



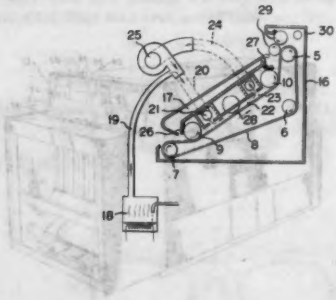
A method of producing copies on nonfibrous, flexible transfer sheets in electrophotographic copying apparatus. In order to reduce friction between each of the nonfibrous transfer sheets in the supply stack a sheet of paper is inserted between each nonfibrous sheet. The sheet-advancing member engages only the nonfibrous sheets and advances them seriatim into the copying apparatus, leaving the sheets of paper in the stack.

3,589,810

PROCESSING DEVICE FOR PHOTOCOPYING MACHINE

Minoru Umahashi, Kanagawa-Ken, and Kenzou Ariyama, Tokyo, both of, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 19, 1968, Ser. No. 785,169
Claims priority, application Japan, Dec. 28, 1967, 42/83602
Int. Cl. G03b *27/32*
U.S. Cl. 355—27 3 Claims



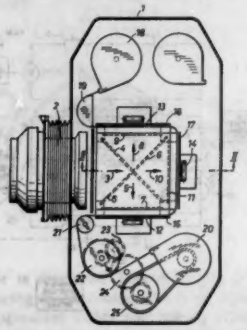
A dry-type processing device for a photocopying machine having photosensitive paper moving on an endless belt through an operational area for exposure to developing gas passing out of an adjoining chamber. Rollers are provided at either end of the operational area in rolling contact with the endless belt and in sliding contact with the chamber.

3,589,811

APPARATUS FOR SPLITTING UP A POLYCHROMATIC LIGHT BEAM INTO THREE COMPONENT MONOCHROMATIC BEAMS

Michel Berger, Saint-Lambert des Bois, France, assignor to Memo International Establishment, Vaduz, Liechtenstein

Filed Dec. 11, 1968, Ser. No. 782,942
Claims priority, application Switzerland, Jan. 19, 1968, 858/68
Int. Cl. G03b *27/76*
U.S. Cl. 355—32 16 Claims



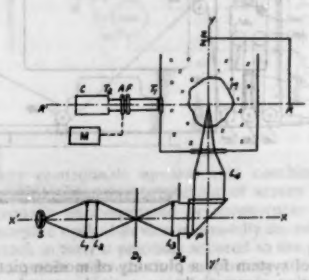
In the production of three monochromatic images on photosensitive surfaces by splitting up a polychromatic light beam into three component monochromatic beams, a non-deformable compact optical unit is provided having two dichroic filters arranged in cross formation for splitting up the polychromatic beam into three monochromatic beams each directed upon one sensitive surface in front of which an interference filter is arranged. The polychromatic beam is split up by the dichroic filters by dividing the visible spectrum thereof into three passbands situated tangent to one another without mutual overlap.

3,589,812

PROCESSES AND DEVICES FOR MEASURING STRESSES WITHIN A TRANSPARENT BODY FOR ELECTROMAGNETIC WAVES

Andre Robert, Malakoff, Seine, and Eliane Guillemet, Asnieres, Seine, both of, France, assignors to Etat Francais (French State) represented by the Minister of the Armies, Ministerial Delegation for Armament Central Direction of Manufactures and Navy Arms, Technical Service for Manufactures and Navy, Paris, France

Continuation-in-part of application Ser. No. 410,208, Nov. 10, 1964, now abandoned. This application Aug. 29, 1968, Ser. No. 767,600
Int. Cl. G01b *11/18*; G01n *21/44*
U.S. Cl. 356—33 6 Claims



The principle of polarization of scattered light is applied to determine the principal stresses in the interior of a model. On

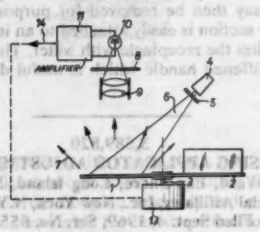
the basis of the theorem which states that "a series of birefringent elements is equivalent to a unique birefringent, followed by a medium endowed with light-rotating power," it is shown that, if the characteristics of a series of birefringent elements are known, it is possible to find the characteristics of an interior section of a model. The desired characteristics are obtained by measuring the A.C. component of the signal from a photomultiplier on which the light to be studied, falls, the light having previously passed through an analyzer rotating at a constant speed about the axis of observation. This new method of measurement is applied to both two- and three-dimensional photoelastic models.

3,589,813

DETECTOR MEANS FOR PULVERULENT, GRANULAR OR FLAKY MATERIAL

Oskar Edwin Sturzinger, Kirchwattweg 6, Baar, Zug, Switzerland

Filed Jan. 5, 1968, Ser. No. 695,995
Claims priority, application Switzerland, Jan. 11, 1967, 453/67
Int. Cl. G01n *21/00, 15/02, 21/11*
U.S. Cl. 356—72 **4 Claims**



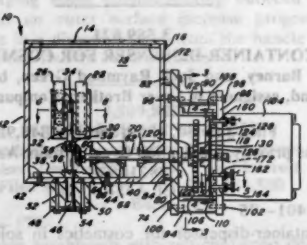
A detector means for loose, flowable bulk material, such as pulverulent, granular, or flaky material, and particularly snow, comprises a surface on which such material is accumulating, a light projector emitting a beam of light and projecting the beam onto the bulk material accumulating on said surface, said bulk material reflecting the light impinging thereon as highly diffused light, and a photoelectric cell is arranged to receive said reflected diffused light, whereby a signal will be emitted by said cell when a certain amount of material has accumulated on the surface. The surface on which the material accumulates is made to optically contrast from the accumulating material, so as to provide for a marked difference in the amount of diffused light projected by the surface without accumulated material thereon, as compared with the amount of diffused light reflected by the accumulated material on the surface.

3,589,814

ROTATING CELL SPECTROPHOTOMETER

Edward B. Patterson, Haddonfield, N.J.; James L. Manniso, Philadelphia, Pa., and Robert F. Dalton, Haddonfield, N.J., assignors to Arthur H. Thomas Company, Philadelphia, Pa.

Continuation of application Ser. No. 534,028, Mar., 1966, now abandoned. This application Dec. 1, 1969, Ser. No. 876,212
Int. Cl. G01j *3/08, 3/42*
U.S. Cl. 356—96 **2 Claims**



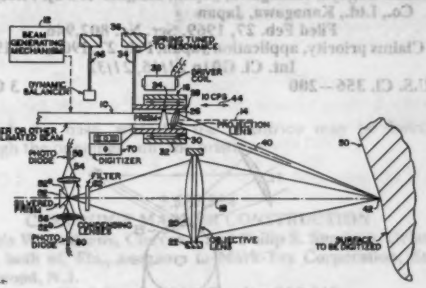
A spectrophotometer uses a single beam of light into which the sample cell and reference cell are alternately rotated. The radiation-sensing circuit includes means to automatically compensate to read 100 percent transmission.

3,589,815

NONCONTACT MEASURING PROBE

Harry L. Hosterman, Akron, Ohio, assignor to Information Development Corporation, Akron, Ohio

Filed June 21, 1968, Ser. No. 739,128
Int. Cl. G01b *11/30;* **G01c** *3/08*
U.S. Cl. 356—167 **10 Claims**



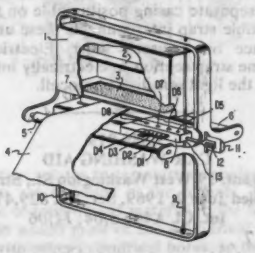
A noncontacting optical probe capable of giving a continuous reading of the distance from a given reference to a contoured surface. A collimated beam is directed parallel to the optical axis of a fixed objective lens whose optical axis defines a measuring axis. The beam is deviated at a slight angle towards the surface to be measured, with the angle defining a projection axis. A lens assembly focuses the collimated beam to a very small diameter image point in front of the objective lens on the measuring axis. Translation of the lens assembly causes the image point to move along the measuring axis a distance equal to the movement of the assembly. The spot is not defocused along the axis. The light reflected from the surface is collected by the objective lens, directed through a filter and focused towards a prism lying in the focal plane of the lens. The prism is a 90° prism with the faces forming the 90° angle brought to a sharp edge at the focal plane of the lens. The amount of light reflected from the respective surfaces of the 90° angle are detected by photocells. The movement of the lens assembly is measured, and compared with the point at which the amount of light detected by the two photocells is equal and above a predetermined value. The distance from the lens assembly to the surface is measured at this instant. Linear reading can be presented in digital form with a resolution of 0.0001 inch, and to an accuracy of 0.0001 if desired.

3,589,816

APPARATUS FOR DETECTING IMPERFECTIONS ON A WEB

Fumio Sugaya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 27, 1969, Ser. No. 802,947
Claims priority, application Japan, Feb. 27, 1968, 43/11960
Int. Cl. G01n *21/18, 21/30, 21/16*
U.S. Cl. 356—199 **3 Claims**



The imperfections on a moving web are detected by optical means. A plurality of photoconductive elements are ar-

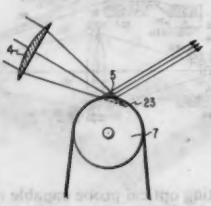
ranged laterally with respect to the advancing direction of the web. The photoconductive elements are reciprocated together in one direction parallel to the direction in which the photoconductive elements are arranged.

3,589,817

PHOTOELECTRIC WEB DEFECT-DETECTING APPARATUS WHICH PROVIDES FOR OVERCOMING THE RAY-DIVERGING EFFECT OF ROLLER CURVATURE

Fumio Sugaya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 27, 1969, Ser. No. 802,946
Claims priority, application Japan, Feb. 27, 1968, 43/11961
Int. Cl. G01n *21/16, 21/32*
U.S. Cl. 356—200 **3 Claims**



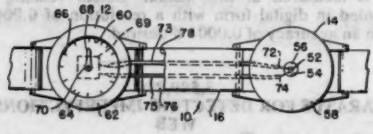
Apparatus for optically detecting imperfections on the surface of a web which is being advanced on a roller. The apparatus comprises a light source for directing light rays onto the surface of the web on the roller, a lens assembly disposed between the light source and the roller for directing parallel light rays toward the web surface, and an optical system for directing the reflected light rays to a photoconductive element.

3,589,818

WRIST-ATTACHABLE PHOTOGRAPHIC LIGHT METER

Harold Mountain, 19324 Fenmore, Detroit, Mich.

Filed Dec. 8, 1969, Ser. No. 883,036
Int. Cl. G01j *1/42, 1/44;* **G02b** *27/32*
U.S. Cl. 356—220 **5 Claims**



The wrist-attachable photographic light meter comprises a wristwatchlike unit including the usual light meter indicator and light sensitive photocell. The light meter indicator is provided in a separate casing positionable on one of the upper and lower wrist surfaces and the light sensitive photocell is provided in a separate casing positionable on the other wrist surface. A flexible strap interconnects these units to hold the device in place on a user's wrist. Electrical wires are mounted on one strap section to electrically interconnect the indicator with the light sensitive photocell.

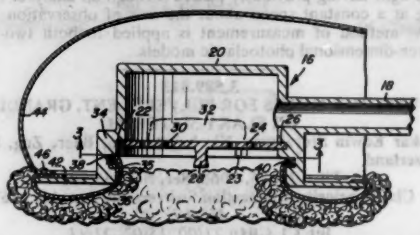
3,589,819

CAR-WASHING AID

Clifford F. Bryant, 19 West Washington St., Struthers, Ohio

Filed June 2, 1969, Ser. No. 829,473
Int. Cl. A46b *5/04, 11/06*
U.S. Cl. 401—7 **4 Claims**

A receptacle having a removable foraminous plate through which water exits to a surface to be cleaned. The receptacle includes a flange portion for mounting a mitt into which a user's hand is placed and a grip maintained on the receptacle thereby enabling locomotion thereof. A ringlike flexible brush is removably mounted to the underside of the receptacle to permit the spreading of cleaning water deposited on the surface to be cleaned. The foraminous base portion of the receptacle is removable thereby allowing the insertion of



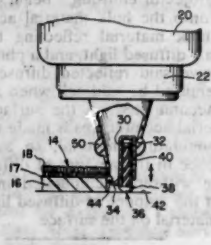
soap into the receptacle during the washing of the surface. The soap may then be removed for purposes of rinsing. A clip-bar bar section is easily attached to an input pipe section which supplies the receptacle with water. The clip-on feature creates a stiffened handle which is useful during the use of the device.

3,589,820

DISPENSING APPLICATOR ADJUSTMENT MEANS

Robert C. Ward, Bay Shore, Long Island, N.Y., assignor to Commercial Affiliates, Inc., New York, N.Y.

Filed Sept. 4, 1969, Ser. No. 855,128
Int. Cl. B43m *11/06*
U.S. Cl. 401—48 **8 Claims**



The invention is for an applicator, such as a glue applicator, which is adapted to place a line or bead of adhesive or the like against a workpiece. There are adjustment means to vary the application height of the line of bead. The adjustment means comprise an adjustable extension bearing in the form of the screw and a screw-receiving portion so that when the screw is screwed into the screw-receiving portion to different depth there will be a corresponding adjustment of the portion of the line of bead of adhesive as applied.

3,589,821

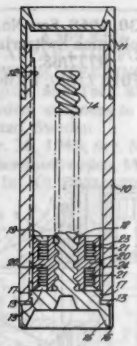
CONTAINER-DISPENSER FOR COSMETICS

Michael Barney, and Jack Raymond Green, both of Leeds, England, assignors to Lever Brothers Company, New York, N.Y.

Filed July 30, 1969, Ser. No. 845,989
Claims priority, application Great Britain, Aug. 9, 1968, 38210/68
Int. Cl. A45d *40/06*
U.S. Cl. 401—75 **5 Claims**

A container-dispenser for cosmetics in solid stick form such as lip salves, the container being of the kind comprising a tubular body, an internally threaded follower slideably and nonrotatably fitted within the body, and a knob actuated

screw-threaded spindle engaging the follower to effect sliding of the follower. The follower is formed as a double ended cup for assembly with the spindle either way round, the assembly being inserted into the container body so that a shoulder on the knob snaps past a retaining rib on the body.



The follower is provided with a continuous ring of grooves on its periphery at least one of which tends to be aligned with a longitudinal rib in the body on assembly and a thin annular flange, pierced on assembly by the rib on the body, acts as a sliding seal between the follower and the body.

3,589,822
DISPOSABLE TOOTHBRUSH
John Batist Manuel, 121 Shell St., Eunice, La.
Filed Apr. 22, 1969, Ser. No. 818,301
Int. Cl. A46b *11/02*; B43k *5/06*
U.S. Cl. 401—172 **3 Claims**

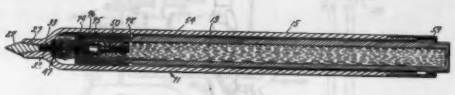
A toothbrush which can be thrown away after a single use. The toothbrush carries its own supply of paste which is discharged onto the bristles for use by rotating the handle. Paste-discharging holes communicating between a supply chamber and an outer surface increase progressively in diameter size in a direction away from the handle to obtain uniform past distribution on the bristles.

3,589,823
DISPOSABLE TOOTHBRUSH
Orrin W. Hendrickson, Los Angeles, Calif., assignor to Wayne S. Werkheiser, Los Angeles, Calif., a part interest
Filed Sept. 2, 1969, Ser. No. 854,580
Int. Cl. B43k *5/06*
U.S. Cl. 401—176 **7 Claims**

A disposable toothbrush with self-contained dentifrice in which bristles, base therefore and handle are molded in integral one-piece construction of flexible resilient material. A recess is defined in the rear of the base for storing the dentifrice and communicates with the bristles via openings

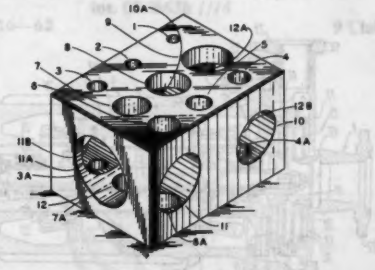
through the base, whereby the dentifrice may be forced through the openings onto the bristles.

3,589,824
CARTRIDGE MARKER CONSTRUCTION
Francis W. Andrews, Clarcona, and Philip S. Sussman, Orlando, both of, Fla., assignors to Mark-Tex Corporation, Englewood, N.J.
Filed Oct. 9, 1969, Ser. No. 865,015
Int. Cl. B43k *5/14*
U.S. Cl. 401—206 **4 Claims**



A cartridge marker having a permanent outer tube element and an expendable inner tube element containing a supply of marking fluid dispensed through a valve at one end thereof. A marking-fluid-dispensing nib is mounted in the outer tube element, and opens the valve in the inner tube element upon the exertion of pressure at an opposite end of the inner tube element resulting in relative movement between the inner and outer tube elements.

3,589,825
TAP-STARTING GUIDE
Frank A. Wojcik, 5417 C. 17th St., Indianapolis, Ind.
Filed Apr. 1, 1969, Ser. No. 812,027
Int. Cl. B23g *5/06*, *5/14*
U.S. Cl. 408—72 **5 Claims**



This invention relates to tap-starting guides. The following improvements are included in the objects. This tap-starting guide is made of tough, hard material in the form of a rectangular block in which most of the cylindrical bores share the same space with other cylindrical bores, so the device is relatively light (one-half pound) and also very compact in size (1¼×1¼×2) with the capacity of containing 12 different

sizes of cylindrical bores (0 to three-quarter diameter). The side opposite the side that contains nine cylindrical bores is a mirror image, therefore a left- or right-hand corner or edge-tapping situation is accommodated simply by inverting the tap guide block. For easy and accurate manufacturing of the tap guide block, the intersecting cylindrical bores cross on center, and there is not a minimum to the flat work surface required to permit the use of the tap guide block. During the tap-starting period lubrication of the tap threads is achieved through the access of an intersecting horizontal cylindrical guide bore. After starting a tap the guide can be removed from the work surface without first removing the tap for large sizes or it may remain on the work surface for the full depth of the thread on very small sizes to act as a steady rest.

3,589,826
DRILL BIT

Willis S. Fenn, Livonia, Mich., assignor to TRW Inc., Cleveland, Ohio

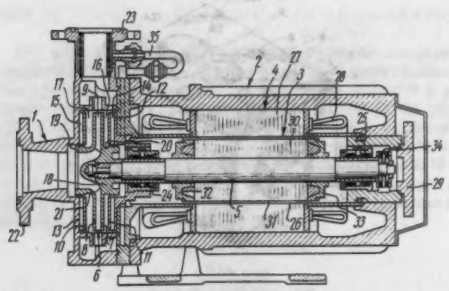
Filed Aug. 25, 1969, Ser. No. 852,736
Int. Cl. B27g *15/00*; B23b *51/02*
U.S. Cl. 408—226 2 Claims

A drill bit having a shank provided with portions of different cross-sectional configuration to enable use of the bit in conventional chucks having either two, three or more jaws.

3,589,827
CENTRIFUGAL LEAKPROOF FLUID PUMP

Sergei Stepanovich Gerasimenko, ulitsa Dimo, 21, kv. 41; Vladimir Semenovich Kurteev, ulitsa Dimitrova, 8, Korpus 2, kv. 34, and Jury Kazimirovich Mitsek, ulitsa Schuseva, 37, kv. 3, all of Kishinev, U.S.S.R.

Filed Aug. 12, 1969, Ser. No. 849,348
Int. Cl. F04d *29/66*, *13/02*
U.S. Cl. 415—106 2 Claims

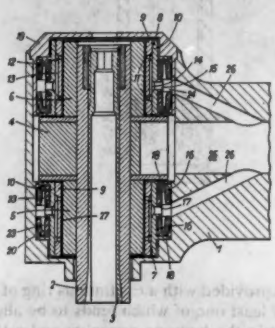


The invention relates to centrifugal leakproof fluid pumps. The pump has a device for balancing the axial forces acting on the rotor, said device being made in the form of two partitions installed on the inner face walls of the pump casing in the spaced between these walls and the impeller discs; the sealing projection of each disc has a circular groove located on the outer surface of the projection and creating, when the rotor is shifted, an additional flow of fluid which brakes the fluid flow between the impeller disc and the partition.

3,589,828
HAND-PIECE OF DENTISTRY WITH AN AIR-DRIVEN TURBINE

David Mosimann, Clos du Lac 3, Bienne (canton of Berne), Switzerland

Filed June 30, 1969, Ser. No. 837,463
Claims priority, application Switzerland, July 1, 1968, 9777/68
Int. Cl. F01d *11/00*; F03b *13/04*
U.S. Cl. 415—112 3 Claims

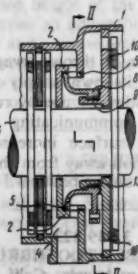


The air-driven rotor of the turbine is journaled at its two ends in air bearings comprising floating sleeves. These sleeves are supported within the cylindrical wall of a housing of the hand-piece by means of inflated plastic shells, each composed of two annular parts having a V-shaped cross section. Air under pressure is supplied simultaneously for inflating the shells and to the air bearings by derivative conduits of the main conduit supplying the turbine with the driving air jet.

3,589,829
SHUTOFF DEVICE FOR STEAM PATH OF STEAM TURBINE

Anatoly Alexandrovich Schetinin, prospekt Metallistov, 18, kv. 74, and Alexandr Konstantinovich Duleev, Chkalovsky prospekt, 38, kv. 24, both of Leningrad, U.S.S.R.

Filed Mar. 13, 1969, Ser. No. 807,778
Int. Cl. F01c *21/12*
U.S. Cl. 415—166 2 Claims



A shutoff device for a steam turbine comprises a stationary annular member fixed in the turbine and having a circumferential array of spaced ports. A rotatable annular member is supported internally of the stationary annular member and which rotatable annular member surrounds the turbine shaft.

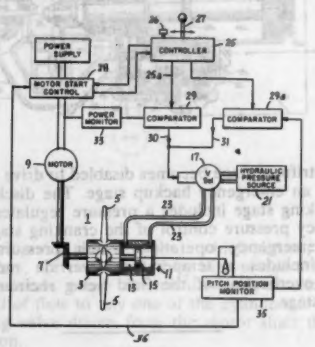
The rotatable annular member includes a circumferential array of spaced ports also. The rotatable annular member is supported so that it may be moved and the ports thereof may be aligned with the ports of the stationary annular member so as to permit the passage of steam into the turbine portion. The rotatable annular member similarly is rotatable so as to bring its respective ports out of alignment with the ports of the stationary annular member so as to block the passage of steam into the turbine.

3,589,830

METHOD OF AND APPARATUS FOR CONTROLLING A VARIABLE PITCH STEERING PROPELLER

Olof Rolf Gosta Mogren, and Tord Birger Svensson, both of Kristinehamn, Sweden, assignors to Aktiebolaget Karlstads Mekaniska, Werkstad, Sweden

Filed Apr. 30, 1969, Ser. No. 820,374
Claims priority, application Sweden, May 3, 1968, 5977/1968
Int. Cl. B63h 25/42
U.S. Cl. 416—1 8 Claims



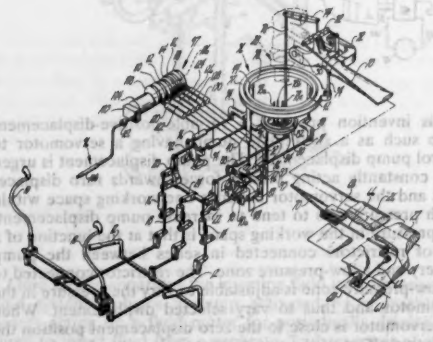
A variable pitch steering propeller for a ship is controlled by continuously monitoring the power supplied to the propeller to drive it and producing a signal indicative thereof, generating a reference signal indicative of a desired propeller power output, comparing the two signals and producing a control signal representative of the difference between the actual power signal and the reference signal and adjusting the pitch of the propeller in accordance with the control signal.

3,589,831

CONTROL SYSTEM FOR ROTARY WING VEHICLE

Andrew Z. Lemnios, Longmeadow, Mass.; Richard W. Hartswick, Granby, and Richard H. Hollrock, Simsbury, Conn., assignors to Kaman Corporation, Bloomfield, Conn.

Filed Nov. 10, 1969, Ser. No. 875,288
Int. Cl. B64c 27/74
U.S. Cl. 416—24 7 Claims



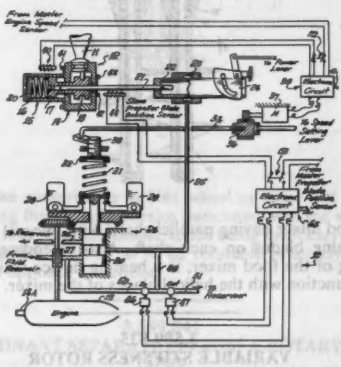
A control system for a helicopter rotor has dual pitch changing mechanisms, one such mechanism for the inboard ends of the blades, and a second for servo flap control of an outboard station of each blade. Conventional cyclic and collective controls are provided in the vehicle, and the dual mechanisms operate in unison at moderate forward speeds, but function differentially at higher speeds to cyclically twist the rotor blades according to a predetermined airspeed schedule so that the advancing and retreating blades are cyclically twisted to reduce and to increase, respectively, the built-in negative twist of the torsionally resilient rotor blades.

3,589,832

PROPELLER SYNCHROPHASER SYSTEM

George F. Harris, Redondo Beach, Calif., and James W. Massey, Scottsdale, Ariz., assignors to The Garett Corporation, Los Angeles, Calif.

Filed Dec. 15, 1969, Ser. No. 885,164
Int. Cl. B64c 11/50
U.S. Cl. 416—34 9 Claims



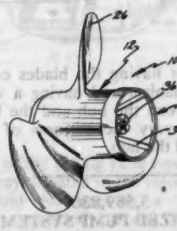
A combined system for synchronizing engine speed and propeller blade phase on multiengine craft with hydraulic blade pitch adjustment wherein each engine has a speed sensor and propeller blade position sensor. Electronic signal comparator and error signal generating circuits effect adjustment of speed governors and propeller blade pitch actuators to first secure engine speed synchronization and propeller blade synchrophasing, the latter being performed without affecting the former.

3,589,833

MARINE PROPELLER ATTACHMENT AND ASSEMBLY

Diore Louis Lancioni, Grand Rapids, Mich., assignor to Michigan Wheel Company, Grand Rapids, Mich.

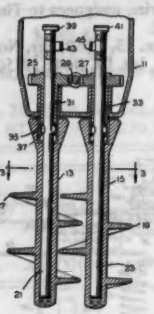
Filed Nov. 13, 1969, Ser. No. 876,523
Int. Cl. B63h 1/18
U.S. Cl. 416—62 9 Claims



Anticavitation, flow-through propeller attachment and combination employing inner and outer concentric but axially displaced rings, the inner being forwardly of the outer and attachable at the mounting of the propeller hub to the drive shaft. The outer ring is connected to the inner ring by radially and rearwardly extending spokes that form generally

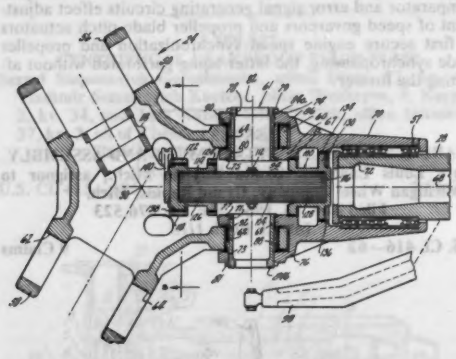
V-shaped recesses with the outer ring to receive the rear edge of the hub. The outer ring extends forwardly around the hub rear edge, terminating in a waterflow-controlling forward face and shearing edge.

3,589,834
HELICAL BLADE MIXER WITH HEATING DEVICE
Carmen P. Cairelli, Farmington, Conn., assignor to Dynamics Corporation of America, New York, N.Y.
Filed Apr. 4, 1969, Ser. No. 813,599
Int. Cl. B01f 7/24
U.S. Cl. 416—95 **9 Claims**



A food mixer having parallel shafts with integral helical intermeshing blades on each shaft. Also extending from the housing of the food mixer, is a heating device which is used in conjunction with the helical blades of the mixer.

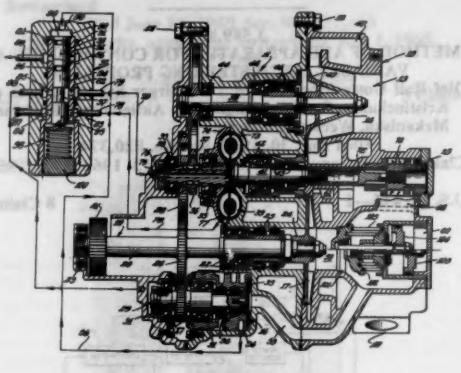
3,589,835
VARIABLE STIFFNESS ROTOR
Arthur W. Linden, Shelton, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed July 17, 1969, Ser. No. 842,487
Int. Cl. B64c 27/48
U.S. Cl. 416—103 **23 Claims**



A multibladed rotor having the blades connected to the hub by a hinge mechanism and having a variable stiffness spring extending between the hub and the blade across the hinge mechanism to vary the stiffness of the connection between the blade and the hub.

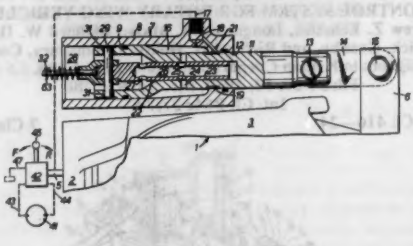
3,589,836
UNITIZED PUMP SYSTEM
Otto J. Danker, and Paul Cooper, both of Cleveland Heights, Ohio, assignors to TRW Inc., Cleveland, Ohio
Filed Nov. 4, 1968, Ser. No. 772,928
Int. Cl. F04b 49/00, 23/14, 41/06
U.S. Cl. 417—47 **14 Claims**

A unitized pump system including a drive means for driving a common low-speed booster stage that receives all inlet fluid for the pump system, a low-flow centrifugal stage that supplies the low-pressure and flow requirements of the system, a high-flow centrifugal stage that furnishes the high-pressure and flow requirements of the system and a cranking stage comprising a high-speed gear pump driven by a hydraulic coupling of the drive means which coupling is drained when the low-flow stage is operating with a sufficient discharge pressure and which coupling is filled when the low-



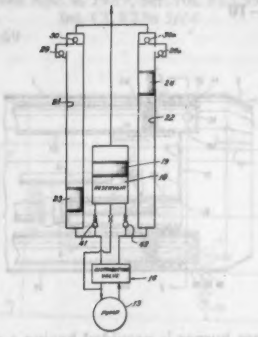
flow centrifugal stage becomes disabled to drive the cranking stage as an emergency backup stage. The discharge line of the cranking stage includes a pressure regulated system for emergency pressure control of the cranking stage discharge during emergency operation which pressure regulating system includes a temperature override mechanism to prevent overheating of the fluid being recirculated to the booster stage.

3,589,837
HYDRAULIC APPARATUS
Kenneth Raymond Boydell, Bredons Hardwick, near Tewkesbury, England, assignor to Dowty Technical Developments Limited, Cheltanham, England
Filed Mar. 20, 1969, Ser. No. 808,780
Claims priority, application Great Britain, Mar. 27, 1968, 14625/68
Int. Cl. F04b 1/12, 1/26, 1/30
U.S. Cl. 417—269 **5 Claims**



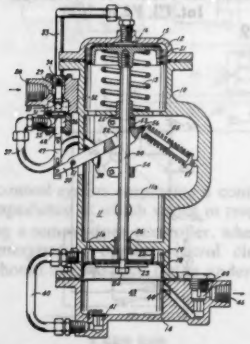
This invention provides a variable-positive-displacement pump such as a swashplate pump having a servomotor to control pump displacement. The pump displacement is urged by a constantly acting biasing force towards zero displacement and the servomotor includes one working space within which pressure acts to tend to increase pump displacement. The pressure in the working space is that at the junction of a pair of restrictors connected in series between the pump delivery and a low-pressure zone. The restrictor connected to the low-pressure zone is adjustable to vary the pressure in the servomotor and thus to vary selected displacement. When the servomotor is close to the zero displacement position the restrictive effect of the two restrictors in series is reduced so as to provide a passage through which the delivery of the pump may flow without generating a substantial pressure.

3,589,838
SUBMERSIBLE MULTIPLE-ACTING FLOATING PISTON DEEP WELL PUMP
John Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Nov. 19, 1969, Ser. No. 878,114
Int. Cl. F04b *17/00*
U.S. Cl. 417—339 10 Claims



A deep well piston pump system in which pistons, in two or more cylinders, are reciprocated by high-pressure hydraulic oil from a hydraulic pump which is driven by an electric motor. Reversal of flow to any one of the cylinders is achieved by a rotating valve driven from the motor shaft through a gear reduction.

3,589,839
FLUID FEEDER FOR PRESSURIZED FLUID SYSTEM
Roger C. Johnson, 10881 Hermosa Court, Northglenn, Colo.
Filed June 23, 1969, Ser. No. 835,328
Int. Cl. F04b *17/00*; F01l *31/02*; F04b *35/00*
U.S. Cl. 417—391 12 Claims

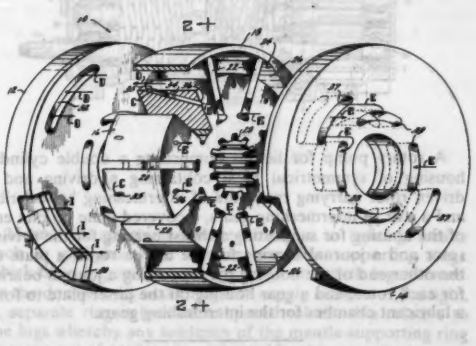


Fluid feeder apparatus for injecting fluid into a pressurized fluid system includes a pump activated by a pressurized system acting on a fluid motor for periodically driving said pump to inject fluid from a separate fluid reservoir at about ambient pressure into said pressurized fluid system. A valve system actuated by said pump cycles the fluid under pressure into and out of the pump.

3,589,840
TURBINES
Edmund Murphy, London, England, assignor to Cooling Developments Ltd., Lucerne, Switzerland
Filed Mar. 18, 1969, Ser. No. 808,115
Claims priority, application Great Britain, Apr. 5, 1968, 16451/68
Int. Cl. F01d *1/24*; F04d *19/00*, *25/02*
U.S. Cl. 417—406 4 Claims

A turbine comprises a turbine wheel or rotor and a series of operating fluid supply nozzles associated with the wheel or rotor, the rotor and the nozzle series being each carried on a freely rotatable shaft so as to be rotatable relatively to one another in opposite directions.

3,589,841
CONTAMINANT SEPARATION FROM A ROTARY VANE PUMP
Carroll W. De Lisse, Cincinnati, Ohio, assignor to General Electric Company
Filed Jan. 28, 1970, Ser. No. 6,378
Int. Cl. F04b *21/06*; F04c *1/00*
U.S. Cl. 418—46 9 Claims



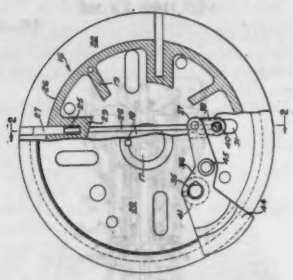
A rotary pump of the sliding vane type is shown with a plurality of passageways located in the rotor of the pump to provide cleaned fluid for use as a lubricant, etc. The passageways are connected on one end to the pumping chambers of the pump and are designed to effectively store fluid trapped therein for a number of revolutions of the rotor, thereby permitting contaminant particles within the passageways to be centrifuged back into the main flow stream of the pump. Cleaned fluid is delivered to a chamber at the opposite end of the passageway from which it is used to maintain the sliding vanes in position and also as a lubricant.

3,589,842

CENTRIFUGAL FORCE ENERGY CONSERVING MECHANISM

Alfred E. Timperley, 85 Chestnut Drive, East Greenwich, R.I.

Filed Oct. 24, 1969, Ser. No. 869,133
Int. Cl. F01c *21/00*; F04c *15/00*; F01c *1/00*
U.S. Cl. 418—151 4 Claims



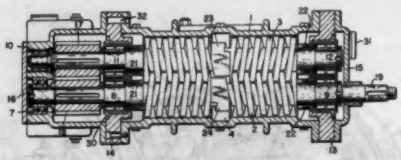
A mechanism for orbiting a machine member in a noncircular orbit at high speeds, such as a sliding vane in a rotary pump or engine which vane changes its position from the center of rotation of the rotor in which it is mounted outwardly and inwardly and thus changes it position for balancing. The invention utilizes a pendulum weight to alternately store and release energy to assist in restoring the sliding vane to its median balanced position.

3,589,843

ROTARY PUMP WITH INTERMESHING HELICAL RIBS

Albert A. Zalis, Warren, Mass., assignor to Warren Pumps, Inc., Warren, Mass.

Filed Feb. 14, 1969, Ser. No. 799,200
Int. Cl. F01c *1/16*
U.S. Cl. 418—202 2 Claims



A rotary pump for liquids comprising a double cylinder housing of symmetrical form containing a driving and a driven rotor carrying two pairs of intermeshing helical ribs, and a pair of intermeshing gears, a covered plate on one end of the housing for supporting a thrust bearing for the driving rotor and a journal bearing for the driven rotor, a plate on the other end of the housing for supporting a journal bearing for each rotor, and a gear housing on the latter plate to form a lubricant chamber for the intermeshing gears.

3,589,844

PROCESS OF BURNING AWAY OIL OR OTHER COMBUSTIBLE LIQUIDS ON WATER OR OTHER NONCOMBUSTIBLE LIQUIDS

Stefan Kraemer, Essen; Alois Seidl, Thurnstein, and Michael Seger, Krefeld-Linn, all of, Germany, assignors to WASAG Chemie Akliengesellschaft, Essen, Germany

Filed Feb. 28, 1969, Ser. No. 803,477
Claims priority, application Germany, Mar. 6, 1968, P 17 08 522.2
Int. Cl. E02b *15/04*
U.S. Cl. 431—8 9 Claims

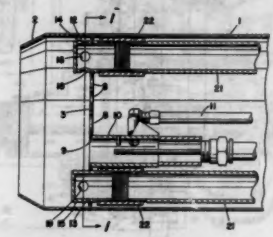
A process for absorbing and burning away oil or other combustible liquids on water or other noncombustible liquids wherein absorbent and/or surface active noncombustible inorganic foamed particles are spread out over the combustible liquid, the combustible liquids are absorbed by the particles and the liquid absorbed by the particles is ignited.

3,589,845

POWER BURNER

James A. Morse, Cleveland Heights, and Donald A. Dray, Parma, both of, Ohio, assignors to The Adams Manufacturing Company, Cleveland, Ohio

Filed Apr. 23, 1969, Ser. No. 818,727
Int. Cl. F23m *3/04*
U.S. Cl. 431—10 7 Claims



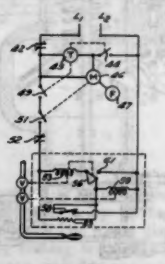
A power gas burner is provided having a perforated plate through which air passes and is mixed with gas introduced into the burner at right angles to the direction of airflow and immediately in front of the plate, to provide a combustible mixture which burns with a short, intense, flame, free from lifting and pulsation. A mantle of gas-free air surrounds the flame to avoid corrosion of parts of the burner. The air for combustion passes through the plate at a high velocity such as to create a partial vacuum at the front of the plate, which is effective to maintain the flame against the plate.

3,589,846

BURNER CONTROL SYSTEM

Donald E. Place, and Donald J. Schmitt, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

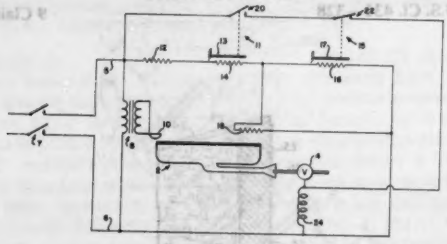
Continuation of application Ser. No. 823,826, May 12, 1969, now abandoned, which is a Division of Ser. No. 680,614, Oct. 30, 1967, Pat. No. 3,497,849, which is a continuation-in-part of application Ser. No. 657,950, Aug. 2, 1967, now abandoned.
Filed Mar. 23, 1970, Ser. No. 21,991
Int. Cl. F23n *5/00*
U.S. Cl. 431—29 27 Claims



A burner ignition and control system including two solenoid valves connected in series between the fuel supply and burner. An electrical resistance-type ignitor is provided to cause ignition and a sensor determines when the ignitor is in ignition condition and when combustion occurs properly. The circuit is arranged to provide automatic recycling when combustion does not occur or is prematurely terminated. A delay is provided when recycling occurs during which the burner and related system is purged of unburned fuel or products of combustion. The sensor is an ambient tempera-

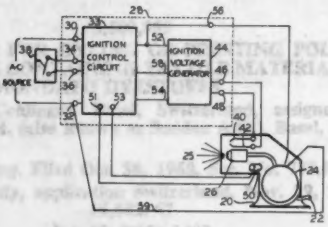
ture compensated device operated by a bimetallic element to sense the rate of radiant heat emission from the ignitor and burner. The sensor is not directly exposed to the high temperature conditions at the ignitor and in the combustion zone so a simple bimetallic element is directly connected to operate the sensor switch.

3,589,847
IGNITION SYSTEM
Keith J. Osborne, Fort Lee, N.J., assignor to Columbia Gas System Service Corporation, New York, N.Y.
Filed Apr. 4, 1969, Ser. No. 813,593
Int. Cl. F23n *5/14*
U.S. Cl. 431—69 **9 Claims**



An electrical system for igniting gas burners to provide safety features as well as an efficient and dependable means for igniting the gas flame. Gas is ignited by a glow coil and a sensor- or probe-type resistance unit imposes a control function to turn off the gas supply if the burner is not ignited within a predetermined time period. The sensor also closes the gas valve whenever the sensor is no longer heated.

3,589,848
OIL BURNER CONTROL SYSTEM
William F. Potts, Liverpool, N.Y., assignor to Liberty Combustion Corporation, Syracuse, N.Y.
Filed Aug. 6, 1968, Ser. No. 750,657
Int. Cl. F23n *5/14*
U.S. Cl. 431—78 **4 Claims**



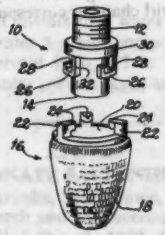
Oil burner control system employing a control transformer the primary impedance of which varies in response to secondary loading by a temperature controller, whereby the variation causes energization of the control circuit. The full specification should be consulted for an understanding of the invention.

3,589,849
DAMPENING CONTROL DEVICE FOR PERCUSSIVE PHOTOFLASH FIRING MECHANISM
Edward L. Sturm, and William H. Horton, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 14, 1969, Ser. No. 850,009
Int. Cl. F21k *5/02*; **G03b** *15/04*
U.S. Cl. 431—93 **10 Claims**

A firing mechanism for use with percussively ignitable flashlamps in a multilamp unit. The mechanism includes a camming device for temporarily withdrawing a mechanical actuating member from the unit in response to rotation of the unit, and is provided with dampening means for preventing accidental firing of the flashlamps upon reentry of the actuating member into the unit. The actuating member is movable

into the unit to sequentially sense the condition of and to fire successive flashlamps in the unit, and the camming device and dampening means include camming surfaces on a unit-receiving socket both to cam the member out of the unit and to permit stepwise return of the member into the unit.

3,589,850
RETAINER MEANS FOR GASLAMP MANTLES
Thomas T. Teeter, Nashville; Earl F. Durr, Nashville; Richard H. Watts, Mount Juliet, and Frank E. Outhier, Nashville, all of, Tenn., assignors to Aladdin Industries Incorporated, Chicago, Ill.
Filed July 28, 1969, Ser. No. 845,408
Int. Cl. F21v *19/06*
U.S. Cl. 431—113 **5 Claims**

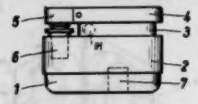


Means for attaching inverted mantles to lighting means such as gaslights. The mantles comprise supporting rings which have fingers for seating engagement with lugs formed on the downwardly extending fuel supply conduit of the light. A separate ring is located in spaced relationship relative to the lugs whereby any tendency of the mantle-supporting ring to move out of position is minimized by the separate ring.

3,589,851
GAS-FUELED LIGHTER
Peter Rabe, Muhlheim (Main), Germany, assignor to Heinrich Maltner G.m.b.H., Offenbach am Main, Germany
Filed July 9, 1969, Ser. No. 840,352
Claims priority, application Germany, July 17, 1968, P 17 82 088.1
Int. Cl. F23q *2/16*
U.S. Cl. 431—131 **9 Claims**

A gas-fueled lighter comprises a fuel tank for liquified gaseous fuel, a burner structure having an inlet and an outlet, igniting means for igniting fuel issuing in gaseous state from

the outlet, vaporizing means upstream of the inlet for receiving fuel in liquid state from the latter and supplying it in vaporized state to the inlet of the burner structure, and a throttling device interposed between the vaporizing means



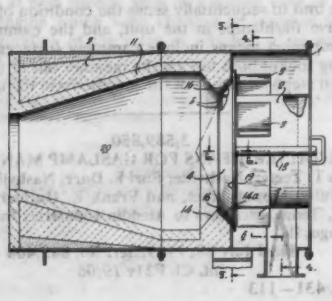
and the fuel tank so as to throttle the flow of fuel from the latter to the former. The throttling device is thermally insulated at least from the burner structure and the vaporizing means so as to prevent vaporization of fuel in the throttling device prior to entry into the vaporizing means.

3,589,852

SWIRL GAS BURNER

William L. Buchanan, Sparta, N.J., assignor to Esso Research and Engineering Company

Filed June 27, 1969, Ser. No. 837,230
Int. Cl. F23r *1/00*
U.S. Cl. 431—158 **9 Claims**



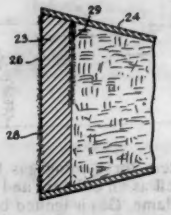
A vortex gas burner having a relatively small and constant diameter inlet air swirl chamber corresponding in diameter to the diameter of the inlet orifice connecting the swirl chamber to the combustion chamber. Gaseous fuel is introduced into the combustion chamber at injection points as close to the divergent section of the burner as possible by the use of a delta-shaped ring burner. The unique geometry of the ring burner achieves this feature along with minimum exposure to high temperatures present in the combustion chamber by being out of the direct line of radiation.

3,589,853

CATALYTIC WALL

Raymond J. Guasco, Paris, France, assignor to Societe Anonyme Francaise Du Perodo, Paris, France

Filed Feb. 12, 1968, Ser. No. 709,527
Claims priority, application France, Feb. 16, 1967, 95,254
Int. Cl. F23d *13/12*
U.S. Cl. 431—328 **9 Claims**



A catalytic wall adapted to be cross through by a gaseous flow from an internal face to an external face in order to facilitate the reaction between said gaseous flow and a gaseous medium bathing the external face, comprising an asbestos based fabric support carrying on the input face a quantity of catalyst smaller than the one provided on the face bathing in said gaseous medium. Such a wall can be used in a catalytic heater apparatus.

CHEMICAL

3,589,854

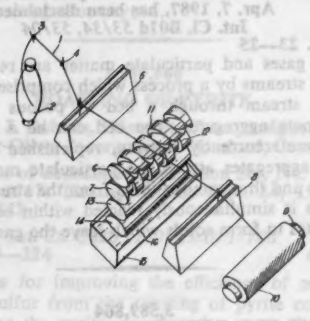
INTERMITTENT CONTACTING OF YARN WITH LIQUID IN A NARROW NIP MOVING ACROSS ROLLERS

Malcolm Carnie Cobb, Caerleon, and Ronald Gibb, Cwmbran, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of application Ser. No. 591,549, Nov. 2, 1966. This application Oct. 13, 1969, Ser. No. 866,163

Int. Cl. D06p *1/00*

U.S. Cl. 8—14 15 Claims



A process for the intermittent application of a liquid or paste along the length of a yarn wherein the yarn is passed through a zone defined by the traversing motion normal to the yarn path of at least one nip formed by the surface portions of two contra-rotating bodies caused to traverse to and fro in a direction normal to the path of the yarn in the zone.

3,589,855

PROCESS FOR DYEING OR PRINTING POLYAMIDE CONTAINING TEXTILE MATERIALS WITH MONOAZO DYESTUFFS

Hanspeter Uehlinger, Basel, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland

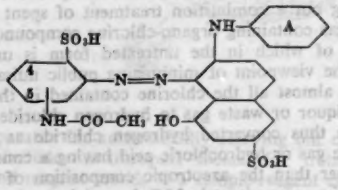
No Drawing. Filed Oct. 30, 1968, Ser. No. 772,001

Claims priority, application Switzerland, Nov. 29, 1967, 16,802/67

Int. Cl. D06p *1/02*

U.S. Cl. 8—41 10 Claims

A process for the dyeing of fibres and textiles which consist of or which contain natural or synthetic polyamides, which process comprises the use of dyes of the formula



(I)

where the aromatic ring A may be further substituted.

3,589,856

POLYMERIZATION OF ETHYLENICALLY UNSATURATED MATERIALS WITHIN PROTEIN PRODUCTS

Leszek J. Wolfram, Silver Spring, Md., assignor to The Gillette Company, Boston, Mass.

No Drawing. Filed Jan. 11, 1968, Ser. No. 696,981

Int. Cl. D06m *13/02*

U.S. Cl. 8—127.5 7 Claims

Polymerization of ethylenically unsaturated monomeric material within protein products is facilitated by introducing a mercaptocarboxylic acid into the aqueous polymerization medium containing a water-soluble persulfate initiator at a pH of 1 to 1.4. If tris(hydroxymethyl)phosphine or tetrakis-(hydroxymethyl)phosphonium chloride is also present the pH may range from 1 to 3.

3,589,857

PROCESS OF BLEACHING TEXTILES

Leo Thomas Murray, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Oct. 24, 1967, Ser. No. 677,745

Int. Cl. D06l *3/02*

U.S. Cl. 8—111 2 Claims

Activator compounds for peroxide bleaching agents comprising alkyl and aryl chloroformates e.g., methyl chloroformate, ethyl chloroformate and phenyl chloroformate.

3,589,858

INHIBITING THE CORROSION OF METALS IN A WATER SYSTEM

Paul H. Ralston, Bethel Park, Pa., assignor to Calgon Corporation

No Drawing. Filed Aug. 20, 1965, Ser. No. 481,421

Int. Cl. C23f *7/08, 9/02, 11/00*

U.S. Cl. 21—2.7 5 Claims

The corrosion of metals in a water system is inhibited by adding to the water a glassy composition consisting of 36 to 42 molar percent P_2O_5, 7.3 to 14.2 molar percent ZnO, 4.4 to 56.7 molar percent K_2O, and up to 52.3 molar percent Na_2O.

3,589,859

GLUCONATE SALT INHIBITORS

Zisis Andrew Foroulis, Morristown, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Oct. 9, 1967, Ser. No. 673,940

Int. Cl. C23f *11/04*

U.S. Cl. 21—2.7 9 Claims

The addition of small amounts of gluconate salts to cooling water systems effectively inhibits oxidative corrosion in such systems. Further, combinations of gluconate salts with other corrosion inhibitors such as benzoate salts and salicylate salts result in synergistic improvement of such inhibition.

3,589,860

CINNAMIC ALDEHYDE INHIBITORS

Zisis Andrew Foroulis, Morristown, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Oct. 9, 1967, Ser. No. 674,002

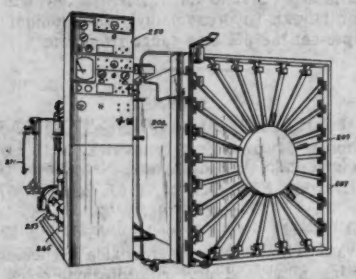
Int. Cl. C23f *11/04*

U.S. Cl. 21—2.7 9 Claims

This disclosure relates to the inhibition of corrosion in chemical and petroleum process equipment exposed to

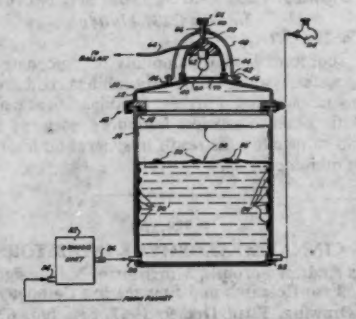
acidic environments. In particular, the present disclosure relates to a method of inhibiting acid-induced corrosion in metal vessels exposed to acid environments by adding to the process streams a very small amount of cinnamic aldehyde or derivatives thereof. It is believed that the cinnamic aldehyde forms a thin film over the metal surface and interferes with the diffusion of acid to the metal.

3,589,861
BALANCED PRESSURE PROCESS OF STERILIZATION
Donald A. Gunther, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.
Filed May 20, 1968, Ser. No. 730,311
Int. Cl. A61l *1/00*
U.S. Cl. 21—58 **25 Claims**



The process disclosed herein deals with sterilizing goods packaged in semi-permeable containers in a permeable gas (ethylene oxide). An impermeable gas is added to the atmosphere of permeable gas and this over-pressure of the impermeable gas is used to confine the package so that no swelling of the package can occur. Air may be used as the impermeable gas to provide the confining over-pressure. This confining pressure balances the effect of the partial pressure of the permeated gas within the package so that the package cannot inflate beyond its original size.

3,589,862
STORAGE APPARATUS FOR WATER PURIFICATION SYSTEM
Louis P. Veloz, 500 S. Madison Ave., Pasadena, Calif. 91106
Filed May 15, 1968, Ser. No. 729,312
Int. Cl. C02b *3/02*; A61l *3/00*; B67d *5/54*
U.S. Cl. 21—102 **12 Claims**

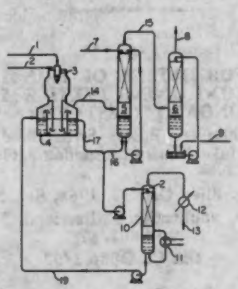


An expandable sterilized bag in a storage tank is secured to inlet and outlet connections so that purified water entering the tank is confined solely within the bag. The top of the tank is closed so that air trapped therein limits the level to which water in the bag can rise. Closure of the top of the tank is effected by an inverted cup having its rim forced against a seal around an opening in the top of the tank, such cup supporting an ultraviolet lamp above a quartz plate that extends across the opening.

3,589,863
METHOD OF REMOVING SULFUR DIOXIDE AND PARTICULATE MATTER FROM GASEOUS STREAMS
Ludo K. Frevel, Midland, and Leonard J. Kressley, Saginaw, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Mar. 8, 1968, Ser. No. 711,480
The portion of the term of the patent subsequent to Apr. 7, 1987, has been disclaimed
Int. Cl. B01d *53/34, 53/04*
U.S. Cl. 23—25 **11 Claims**

Acid gases and particulate matter are removed from gaseous streams by a process which comprises passing the gaseous stream through a bed of porous alkali metal bicarbonate aggregates. The bed can be a fixed system or a countercurrently moving, replenished system. The porous aggregates attract the particulate matter to their surfaces and thus remove them from the stream while the acid gas is simultaneously reacted within or around the aggregates to form solids which leave the gaseous stream.

3,589,864
PROCESS FOR RECOVERING HYDROGEN CHLORIDE FROM A SPENT ORGANO-CHLORINE COMPOUND
Shigeho Ezaki, Kanagawa-ken, Japan, assignor to Yawata Chemical Engineering Co., Ltd., Tokyo, Japan
Filed Apr. 1, 1969, Ser. No. 811,905
Claims priority, application Japan, Apr. 3, 1968, 43/21,404
Int. Cl. C01b *7/08*
U.S. Cl. 23—154 **1 Claim**



An economical process for recovering hydrogen chloride from a spent organo-chlorine compound comprising carrying out a combustion treatment of spent liquor or waste gas containing organo-chlorine compound, the discharge of which in the untreated form is undesirable from the viewpoint of minimizing public nuisance, converting almost all the chlorine contained in the organic spent liquor or waste gas to hydrogen chloride, recovering the thus converted hydrogen chloride as hydrogen chloride gas or hydrochloric acid having a concentration of higher than the azeotropic composition of HCl-H_2O system i.e. approximately 20% by weight, and at the same time, discharging other components into the atmosphere in the form of completely harmless and odorless gases.

3,589,865

SYNTHESIS OF AMMONIA

Eugene E. van Tamelen, Los Altos Hills, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

No Drawing. Filed July 30, 1968, Ser. No. 748,637

Int. Cl. C01c *1/00*

U.S. Cl. 23—193 10 Claims

Molecular nitrogen is converted to ammonia at room temperature and atmospheric pressure by a process of contacting nitrogen or air with a Ti^{IV} or Ti^{III} compound during its reduction to a Ti^{II} compound in a suitable solvent, followed by addition of a protonating agent. The process may be used for purposes other than the production of ammonia, such as scavenging gases or sensing the presence of nitrogen or oxygen.

3,589,866

ROASTING OF PYRITE

Elliott J. Roberts, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation of abandoned application Ser. No. 653,976, July 17, 1967. This application Sept. 24, 1969, Ser. No. 860,843

Int. Cl. C22b *1/10*; C01b *17/06*

U.S. Cl. 23—224 4 Claims

A process for improving the efficiency of generating elemental sulfur from the roasting of pyrite comprising preclassifying the pyrite; roasting the coarse fraction in a main roasting system; roasting the fine fraction in an auxiliary roasting system; and, combining at least part of the product of the auxiliary roasting system with one of the products of the main roasting system.

3,589,867

METHOD AND APPARATUS FOR AUTOMATICALLY CARRYING OUT CHEMICAL ANALYSIS

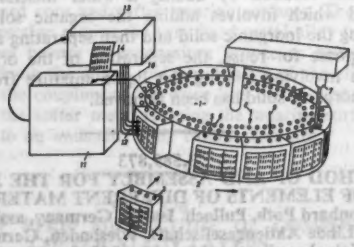
Peter Heinz, Oberuhldingen, and Gerhard Podschadly, Uberlingen (Bodensee), Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen (Bodensee), Germany

Filed June 19, 1968, Ser. No. 738,191

Claims priority, application Germany, June 24, 1967, B 93,182

Int. Cl. B65b *1/30*; G01n *1/00*

U.S. Cl. 23—230R 12 Claims



An apparatus for automatically carrying out chemical analysis includes a transport means for transporting sample and reagent vessels to a sample-reagent combination station and to an analysis station and means responsive to automatic sensing means for identifying the sample under analysis.

3,589,868

APPARATUS FOR QUANTITATIVE ANALYSIS OF A PARTICULAR CONSTITUENT OF A SAMPLE

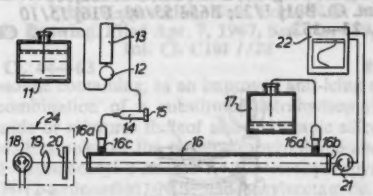
Keichiro Hozumi, Kyoto, Japan, assignor to Yanagimoto Manufacturing Co., Ltd., Kyoto, Japan

Continuation-in-part of application Ser. No. 605,266, Dec. 28, 1966. This application June 19, 1967, Ser. No. 647,095

Claims priority, application Japan, Dec. 29, 1965, 41/81,261, 41/81,262; June 21, 1966, 41/40,548

Int. Cl. G01n *21/26*

U.S. Cl. 23—232 13 Claims



Apparatus for quantitative analysis of a particular constituent of a sample in which a fluid including a sample material continuously flows through an elongated light absorption cell disposed between a light source and photoelectric light receiving means. Apparatus for the measurement of the concentration of carbon monoxide contained in a sample gas in which carbon monoxide is oxidized by an iodine compound with the result of freeing iodine vapor therefrom and the free iodine vapor concentration is measured by the absorption photometry with use of a wavelength within the range of 480–580 mμ.

3,589,869

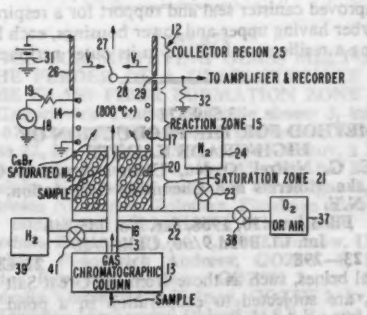
CHEMICAL-IONIZATION DETECTION METHOD AND APPARATUS

Martin E. Scolnick, Kensington, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Feb. 17, 1969, Ser. No. 799,829

Int. Cl. G01n *27/62*, *31/12*

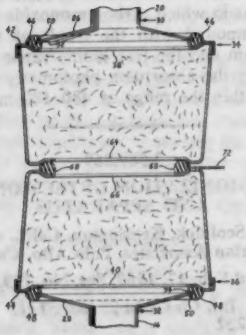
U.S. Cl. 23—232 10 Claims



A chemical-ionization detector capable of being operated in a specific detection mode for the specific detection of compounds of sulphur, nitrogen, phosphorus, etc., in the presence of hydrocarbons. The detector is also capable of being operated in a non-specific mode for the detection of hydrocarbons. In the specific detection mode,

a non-hydrocarbon constituent of the sample to be detected is reacted with an alkali metal vapor in a reaction zone by the application of heat supplied by a heater in heat exchanging relationship with the reaction zone. In the reaction zone, a chemi-ionization reaction occurs in the absence of oxygen with certain non-hydrocarbon constituents of the gas stream to be analyzed. The ions thus produced are collected by the action of an electric field to produce an ion current of an amplitude determinative of the amount of non-hydrocarbon constituent.

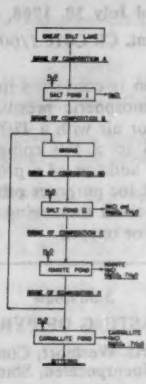
3,589,870
CANISTER HOLDER
Thomas F. Rankin, 444 Warren St., Hudson, N.Y. 12534
Filed Aug. 20, 1969, Ser. No. 852,008
Int. Cl. B01j *1/22*; B65d *53/02*; F16j *15/10*
U.S. Cl. 23—252 **2 Claims**



An improved canister seal and support for a respiratory gas absorber having upper and lower housings, each housing having a resilient seal affixed to its outer periphery.

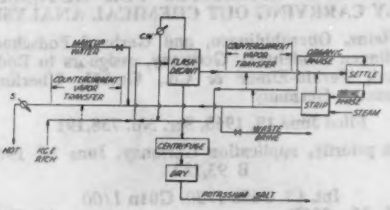
3,589,871
METHOD FOR THE PRODUCTION OF HIGH-GRADE KAINITE
Ulrich E. G. Neitzel, Ogden, Utah, assignor to Great Salt Lake Minerals and Chemicals Corporation, New York, N.Y.
Filed June 10, 1968, Ser. No. 735,840
Int. Cl. B01d *9/00*; C13k *1/10*
U.S. Cl. 23—298 **21 Claims**

Natural brines, such as those from the Great Salt Lake of Utah, are subjected to evaporation in a pond until they are saturated with potassium salts. The brine is then transferred to a mixing pond wherein it is mixed with a second brine which contains a higher molar ratio of magnesium to potassium. The thus-adjusted brine is subjected to pond evaporation to precipitate sodium chloride until it is again saturated with respect to potassium salts. The brine is then transferred to another pond wherein it is subjected to further evaporation to precipitate kainite. The kainite is precipitated until carnallite begins to form, at which time the brine is transferred to another pond and is subjected to additional evaporation to precipitate carnallite. Some of the kainite-depleted brine is recycled to the mixing pond. After carnallite has precipitated, in the



evaporation pond, the residual brine is transferred to deep storage and subjected to winter cooling to precipitate additional carnallite. The precipitated carnallite is converted to kainite by contacting it with kainite-saturated brine.

3,589,872
PRECIPITATING KCl FROM AN AQUEOUS SOLUTION WITH NaCl BY ADDING PYRIDINE AND N-METHYL-MORPHALINE
Maxwell Patrick Sweeney, 1715 Silverwood Terrace, Los Angeles, Calif. 90026
Filed July 10, 1967, Ser. No. 652,238
Int. Cl. B01d *9/02*; C01d *3/04*, *3/08*
U.S. Cl. 23—300 **2 Claims**

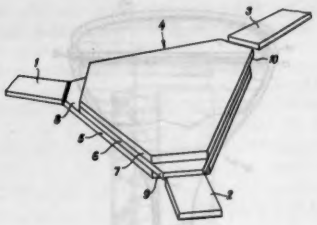


A process for recovering an inorganic solid from an aqueous solution by adding a water miscible organic liquid which involves adding the organic solvent, separating the inorganic solid and then separating an organic rich phase for reuse, the separation of the organic rich phase involving heating the liquid mixture from which the inorganic solid has been removed.

3,589,873
METHOD OF AND ASSEMBLY FOR THE JOINING OF ELEMENTS OF DIFFERENT MATERIALS
Leonhard Poth, Pullach, Isartal, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany
Original application Mar. 23, 1965, Ser. No. 442,317. Divided and this application Sept. 3, 1968, Ser. No. 775,217
Claims priority, application Germany, Mar. 25, 1964, G 40,198
Int. Cl. B32b *15/00*
U.S. Cl. 29—191 **6 Claims**

Flat or tubular elements of difficultly bondable materials are joined together with the aid of a transition

piece in which layers of these materials are bonded to one another, each layer projecting beyond the remaining

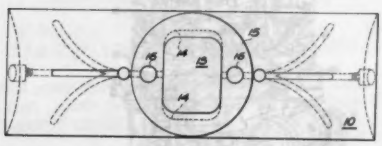


layer or layers at one or more locations at which it is welded or otherwise fused to the corresponding element.

3,589,874
COMPOSITE OF COPPER BASE ALLOY ON STEEL
Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation
No Drawing. Filed Aug. 2, 1968, Ser. No. 749,576
Int. Cl. B32b *15/00*
U.S. Cl. 29—196.3 **19 Claims**

A composite metal article comprising a copper base alloy containing iron and/or cobalt and an iron base alloy component integrally bonded together.

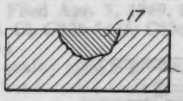
3,589,875
SLIPPER BEARING
Grant A. Oakes, R.D. 4, Cortland, Ohio 44410
Filed Jan. 17, 1969, Ser. No. 792,008
Int. Cl. B32b *15/00*
U.S. Cl. 29—199 **3 Claims**



A slipper such as used in a coupling in a drive line on a blooming mill comprises a replaceable bearing forming part of the coupling. The slipper bearing disclosed is of conventional size and shape and is a composite structure having a hard core and softer wearing surfaces. The soft shell construction retains the very hard metal alloy usually aluminum bronze or magnesium bronze as necessary for maintaining the shape and positioning of the slipper bearing in the coupling of the drive line of the blooming mill while the softer metal forming the wearing surfaces contribute to an unusually long trouble free life.

3,589,876
BUILT UP STRIP MILL GUIDE OF COMPOSITE COPPER ALLOY LAYERS
Grant A. Oakes, R.D. 4, Cortland, Ohio 44410
Filed Feb. 28, 1969, Ser. No. 803,295
Int. Cl. B32b *15/00*
U.S. Cl. 29—199 **4 Claims**

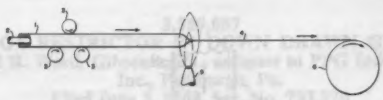
A strip mill guide such as positioned between the stands of rolls in a rolling mill and particularly adjacent the stands of rolls so as to suitably guide the traveling strip relative thereto is disclosed having an elongated central area built up with a tin lead copper alloy characterized by its ability to prevent dendritic grain structure forming in the guide body and thereby strengthen the same so as to provide a greatly increased life.



3,589,877
GASOLINE ANTI-ICING
Lawrence J. Balash, Southfield, Mich., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Apr. 7, 1967, Ser. No. 629,105
Int. Cl. C10l *1/28*
U.S. Cl. 44—63 **8 Claims**

Gasoline containing, as an improved anti-icing additive, the combination of a substituted tetrahydropyrimidine, an amide or mixtures thereof and an organic silicon compound. Examples of the tetrahydropyrimidine and amide are 1-octadecenyl-2-methyl-1,4,5,6-tetrahydropyrimidine and N-(2-aminoethyl)-N-heptadecenylacetamide. Examples of suitable organic silicon compounds are polyhydrocarbylsiloxanes and alkyl silicates.

3,589,878
DEVITRIFICATION OF THE CORE OF A COAXIAL GLASS FIBER
Claude Achener, Paris, France, assignor to Quartz & Silice, S.A., Paris, France
Filed Sept. 10, 1968, Ser. No. 758,778
Int. Cl. C03c *23/20;* **C03b** *29/00, 17/00*
U.S. Cl. 65—3 **4 Claims**

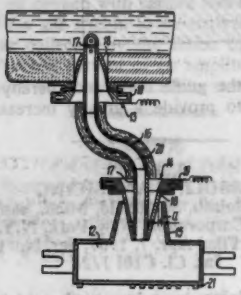


Filaments consisting of a core of devitrified glass surrounded by a layer of glass in compression. The method of producing those filaments comprising drawing them from a layer of silica glass fused to a core of devitrifiable glass and heating the drawn filaments at a temperature that will devitrify the devitrifiable glass without deforming the silica glass.

3,589,879
DEVICE FOR SUPPLYING GLASS MELT FROM THE FEEDER OF A GLASS FURNACE INTO THE GLASS FIBER FORMATION ZONE
Petr Grigorievich Yantsev, Otkrytie shosse 3, korpus 1, kv. 67; Alexandr Mikhailovich Prokhorov, Bazovskaya ulitsa 22, kv. 72; Sergei Sergeevich Kutukov, 1 Nizhne-Likhoborsky proezd 16, kv. 45; Nikolai Pavlovich Koninin, Kurbatovsky pereulok 48, korpus 5, kv. 6; Antonina Nikolaevna Zolotova, Flotskaya ulitsa 94, kv. 57; and Rafail Grigorievich Chernyakov, Ulitsa Marshala Birjuzova 21, kv. 7, all of Moscow, U.S.S.R.; Stanislav Fedorovich Andreev, GOZSV 1, kv. 30; Viktor Petrovich Novikov, GOZSV 2, kv. 10; and Ljudmila Vladimirovna Tsyrina, GOZSV 1, kv. 72, all of Krjukovo Moskovskoi Oblasti, U.S.S.R.; and Nikolai Evgenievich Koslov, Oktyabrskaya 14-a, Skhodnya Moskovskoi Oblasti, U.S.S.R.
Filed Apr. 25, 1969, Ser. No. 819,319
Int. Cl. C03b *37/02*
U.S. Cl. 65—11 **1 Claim**

This invention pertains to an apparatus for forming glass fibers in which there is a furnace for supplying molten glass to a plurality of nozzle feeders spaced from the

furnace. Molten glass is fed through a thermally insulated metal tube that connects the bottom of a furnace feeder with the nozzle feeder in which each of these is fitted with



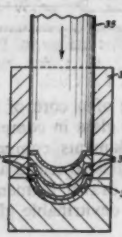
a metal tube with the thermally insulated tube between these metal tubes. A current conducting heating member is fitted onto the furnace feeder and another on the throat in the inlet to the nozzle feeder.

3,589,880

PLURALITY OPTICAL ELEMENT PRESSING PROCESS

Richard E. Clark, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of application Ser. No. 596,230, Nov. 22, 1966. This application Mar. 24, 1970, Ser. No. 20,463
Int. Cl. C03b *23/20*
U.S. Cl. 65—18 6 Claims



The invention relates to hot pressing of a plurality of optical elements of magnesium fluoride, zinc sulfide, calcium fluoride, zinc selenide, magnesium oxide, cadmium telluride, lanthanum fluoride, cadmium sulfide, zinc oxide, strontium fluoride, titanium dioxide, and cadmium selenide, by preliminary preparing the individual elements, applying a parting layer to each element, stacking the individual elements for plural hot fusion pressing to the resultant optical elements, as to prevent shifting of the individual elements during final fusion pressing.

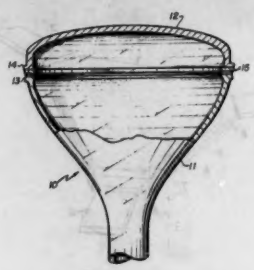
3,589,881

NON-DESTRUCTIVE SEVERANCE OF HERMETIC SEALS

Robert C. Langley, Millington, Herbert Myers, Newark, and Leonard R. Rubin, Union, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.

Filed June 24, 1968, Ser. No. 739,477
Int. Cl. C03b *33/00*
U.S. Cl. 65—23 1 Claim

Hermetic seals comprised of a palladium-containing layer across the bonding plane of the seal can be opened non-destructively by subjecting them to hydrogen under critical conditions of palladium expansion, e.g. below



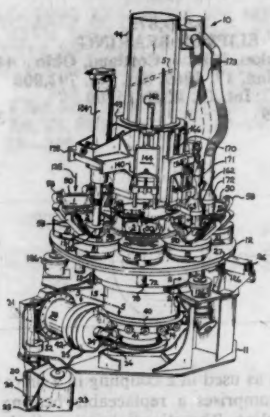
about 310° C. The severed seals can be reunited by refiring.

3,589,882

APPARATUS AND METHOD FOR FORMING HOLLOW GLASS ARTICLES

Walter H. Carstensen, Toledo, and Donald G. Davey, Oregon, Ohio, assignors to Owens-Illinois Inc.

Filed Apr. 28, 1967, Ser. No. 634,706
Int. Cl. C03b *9/46, 11/00*
U.S. Cl. 65—70 9 Claims



A multi-staged arcuately-driven machine for centrifugally molding hollow glass articles. An apparatus for receiving molten gobs of glass in a mold partially pressing the glass into the desired shape at a station different from that where the glass was introduced, and spinning to final configuration, followed sequentially by scoring the glass articles at yet another station so that an unwanted portion can be subsequently removed therefrom.

3,589,883

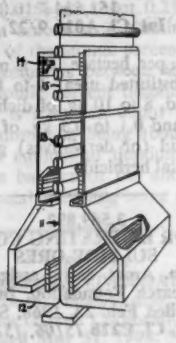
METHOD AND APPARATUS FOR THERMALLY FRACTURING A RIBBON OF GLASS

Terrence A. Dear, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 28, 1968, Ser. No. 732,686
Int. Cl. C03b *33/00, 33/10*
U.S. Cl. 65—97 5 Claims

A method of stripping the bulb edge from a sheet of window glass in a drawing machine by thermally induc-

ing stresses in the glass and causing the glass to separate along the line of stress induction. The apparatus is a thermal source having a means for focusing and controlling the thermal output to the glass ribbon. The thermal energy is focused to a point on the surface of the glass, the energy being in an amount sufficient to upset the existing balance of tension and compression through the thickness of the glass and to induce a fracture in the glass.

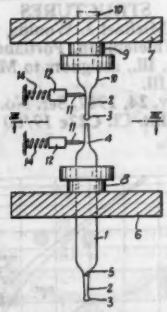


3,589,884

GLASS BULBS AND THE LIKE CONTAINERS PROVIDED WITH SELF-BREAKABLE NECKS

Raymond Guiriec, Longjumeau, France, assignor to Société à Responsabilité Limitée Laboraver, Longjumeau, France

Filed Mar. 5, 1969, Ser. No. 804,554
Claims priority, application France, Mar. 5, 1968, 142,377
Int. Cl. C03b *21/00*
U.S. Cl. 65—105 2 Claims



A method and means for obtaining a self-breakable bulb or phial, that is a bulb or phial requiring no file for cutting it open; to this end, the edge of a blade of silver, aluminium or aluminium alloy is urged against the neck of the container during its cooling so as to locally increase its capacity of thermic dissipation and to consequently produce an internal straining leading to a greater brittleness. Advantageously the bulb or the like container is caused to revolve round its axis during the procedure so as to ensure an annular marking whereby the neck may be broken in a clean manner by a flexional stress exerted on it whatever the direction of the stress may be.

3,589,885

GLASS MELTING WITH A REFINING AGENT

Joseph R. Monks, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed Apr. 7, 1969, Ser. No. 814,181
Int. Cl. C03b *5/16*; C03c *3/04*
U.S. Cl. 65—134 7 Claims

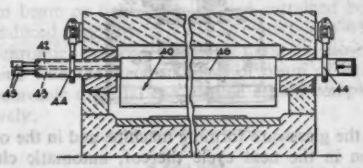
An improved quality glass is produced by employing in the charge of glass-forming ingredients, a small amount of an organic reducing agent which has been impregnated with water soluble sulfates.

3,589,886

FLOAT GLASS APPARATUS WITH A RADIATION GATE

Eldwin C. Montgomery, Modesto, Calif., assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Continuation-in-part of application Ser. No. 612,680, Jan. 30, 1967. This application Dec. 8, 1969, Ser. No. 883,227
Int. Cl. C03b *18/00*
U.S. Cl. 65—182 4 Claims



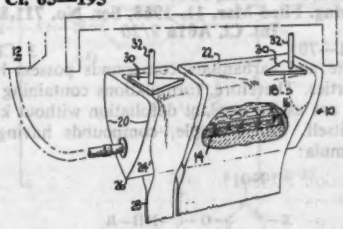
A radiation gate for use in a float glass apparatus involving a metallic casing having a core of insulating material in its lower portion, fluid cooled support means above the core of insulation and an outer wall around the support-containing portion and spaced from the casing with insulation therebetween.

3,589,887

EDGE RESTRICTOR IN DOWN DRAWN GLASS

Cecil R. Ward, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 3, 1968, Ser. No. 733,870
Int. Cl. C03b *17/00*
U.S. Cl. 65—195 3 Claims



In order to produce a substantially uniform thickness sheet of glass by the downdraw process which utilizes a nozzle having edges over which the glass flows, adjustable pyramidal-shaped members are provided to adjust and restrict the quantity of glass which flows over the nozzle adjacent to its ends and to substantially eliminate the usual bulb edge.

3,589,888

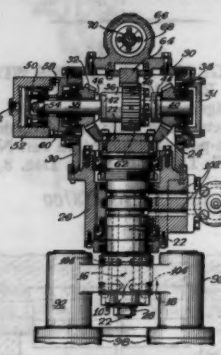
DOUBLE GOB TAKE-OUT ASSEMBLY FOR GLASSWARE FORMING MACHINES

Kenneth R. Hileman, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.

Filed Oct. 25, 1968, Ser. No. 770,607
Int. Cl. C03b *9/44*
U.S. Cl. 65—260 14 Claims

A take-out assembly for glassware forming machines having a shaft-carried rotatable cross arm, each end of

the cross arm carrying an engaging and supporting means for a molded article and operable to remove the molded article from a mold of a mold carrier member, oscillate 180° in one direction, and deposit the article on a take-away conveyor. The assembly has a reversing gear arrangement whereby fluid pressure operated means in the form of a cylinder, a piston therein, and a rack and pinion connection with a bevel gear on the cross arm shaft oscillates the shaft in one direction in one cycle of opera-



tion of the glassware forming machine and in the opposite direction in the next cycle thereof, automatic clutching means being provided for clutching one bevel pinion to the rack pinion during the first cycle and another bevel pinion to the rack pinion during the second cycle, the two bevel pinions being in mesh with the bevel gear on the rotatable cross arm shaft whereby it is rotated 180° in one direction during the first cycle and 180° in the same direction during the second cycle.

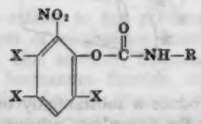
3,589,889

HERBITOXIC CARBAMATE AND CARBANILATE COMPOSITIONS AND METHOD USING SAME

Henry G. Braxton, Jr., Franklin Village, Mich., and Evelyn J. Lajiness, Racine, Wis., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Mar. 11, 1968, Ser. No. 711,836
Int. Cl. A01n *9/20*
U.S. Cl. 71—70 **3 Claims**

Carbamate and carbanilate compounds possess herbitoxic properties. Therefore, formulations containing such compounds are useful in plant defoliation without killing the plant itself. For example, compounds having the general formula:



such as 3,4,6 - trichloro - 2 - nitrophenyl carbanilate; 3,4,6 - trichloro - 2 - nitrophenyl p-chlorocarbanilate; and 3,4,6 - trichloro - 2 - nitrophenyl n-butylcarbamate.

3,589,890

METHOD OF DEFOLIATING AND DESICCATING PLANTS WITH ORGANOLEAD COMPOUNDS

John C. Wollensak, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed July 11, 1968, Ser. No. 743,918
Int. Cl. A01n *9/00*
U.S. Cl. 71—70 **7 Claims**

Organolead compounds possess herbitoxic properties. Therefore, formulations containing such compounds are useful in controlling undesirable vegetation or in plant defoliation without killing the plant itself.

3,589,891

COMPOSITION FOR TOTAL WEED KILLING

Jacques Mocotte, St.-Didier-au-Mont-d'Or, and Francoise Prost, Villeurbanne, France, assignors to Progil, Paris, France

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,106
Claims priority, application France, May 13, 1968, 151,634
Int. Cl. A01n *9/22*
U.S. Cl. 71—94 **5 Claims**

An application, per hectare, of a mixture comprising 4 to 6 kg. of substituted urea, 4 to 8 kg. of phenoxy-acylated compound, 8 to 10 kg. of dichloropropionic acid (or derivatives) and 0.1 to 0.5 kg. of 4 amino-3,5,6-trichloropicolinic acid (or derivatives) gives very satisfactory results as a total herbicide.

3,589,892

PROCESS FOR LIBERATING COPPER FROM SULFIDE ORES

David T. Peterson, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

No Drawing. Filed Feb. 23, 1968, Ser. No. 707,403
Int. Cl. C22b *15/06, 15/14*
U.S. Cl. 75—72 **6 Claims**

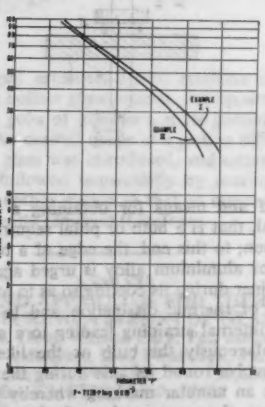
In the production of copper from sulfide ores, it is conventional to prepare by mineral-dressing operations a finely divided concentrate composed principally of copper sulfides and iron sulfides. Instead of forming the concentrate into a matte and conversion of the matte to blister copper, the concentrate is roasted without melting under oxidizing conditions to a finely divided mixture of copper oxides and iron oxides. This intermediate product is then heated under selective reducing conditions to reduce the copper oxide to metallic copper without appreciably reducing the iron oxide. By virtue of this series of heating steps where the copper is first oxidized and then reduced, an opportunity is provided for the growth in size of the copper particles. The product will therefore contain metallic copper in the form of relatively large particles which can be recovered by conventional mineral-dressing operations, for example, by grinding and flotation.

3,589,893

SULFIDATION RESISTANT ALLOYS AND STRUCTURES

Carl H. Lund and Michael J. Woulds, Arlington Heights, Ill., Rudolf H. Thielemann, Portland, Oreg., and John Hockin, Palatine, Ill., assignors to Martin Metals Company, Wheeling, Ill.

Filed Nov. 24, 1967, Ser. No. 685,546
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **14 Claims**



A nickel-containing alloy and hot stage gas turbine parts made therefrom comprising in weight percent about

16% chromium, about 20% cobalt, a member of the group consisting of molybdenum, tantalum, columbium and mixtures thereof within the range of up to 4% molybdenum, up to 5% tantalum and up to 2.5% columbium (niobium), about 0.25% to about 5% tungsten, about 0.03% to about 0.2% carbon, about 0.005% to about 0.05% boron and about 0.01% to about 0.2% zirconium. The alloy also contains amounts of aluminum and titanium such that the ratio of the atomic percent aluminum to the atomic percent titanium is between about 1 and 2 and the total of the atomic percent titanium and the atomic percent aluminum is less than about 12 with the minimum amount of aluminum being about 2.5% by weight and the maximum amount of titanium being about 5% by weight and the balance of the alloy, except for impurities and incidental elements, being nickel.

3,589,894

SULFIDATION RESISTANT COBALT-BASE ALLOY

Milton S. Roush, Phoenix, Ariz., assignor to The Garrett Corporation

No Drawing. Filed May 31, 1968, Ser. No. 744,588
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **8 Claims**

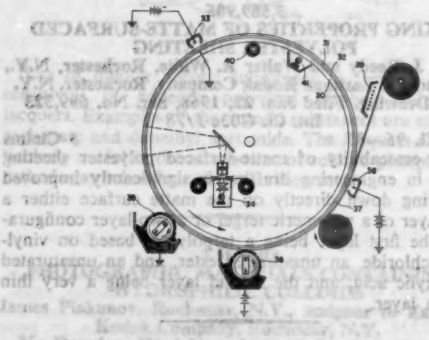
A sulfidation resistant cobalt-base alloy comprises a major amount of cobalt, between about 5 and about 30% chromium between about 0.05% and about 3.0% by weight of a metal selected from the group consisting of scandium, lanthanum and lanthanide series metal, between about 1.0% and about 6.0% by weight aluminum and preferably also containing tungsten and/or molybdenum, columbium and/or tantalum and carbon.

3,589,895

ELECTROGRAPHIC DEVELOPING METHOD SUITED FOR TRANSFER ELECTROPHOTOGRAPHY WITHOUT CLEANING

Ivan B. Ville, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 17, 1967, Ser. No. 653,934
Int. Cl. G03g *13/22*
U.S. Cl. 96—1.4 **14 Claims**



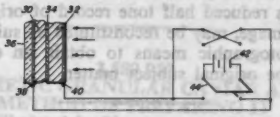
A method of toning an electrostatic image on a surface in two steps: (1) brushing, rubbing or otherwise contacting the image-bearing surface with fibers, particles or other materials capable of properly triboelectrically charging toner on the surface to the proper polarity in presence of a field adapted to repel improperly charged toner from the surface, and (2) toning the image, for example, by brushing. This method is particularly suited to repetitive transfer xerography without cleaning of the surface of the photoconductive element.

3,589,896

ELECTRO-OPTICAL ARTICLE EMPLOYING ELECTROCHROMIC AND PHOTOCONDUCTIVE MATERIALS

David E. Wilcox, Whitesboro, N.Y., assignor to the United States of America as represented by the Secretary of the Air Force

Filed May 27, 1968, Ser. No. 732,156
Int. Cl. G03g *5/08, 5/02*
U.S. Cl. 96—1.5 **1 Claim**



The switching of electrochromic materials by means of electron beam or light beam excited sustained bombardment induced conductivity (SBIC) materials in which the electrochromic material becomes dark at those points addressed with the electron beam or beam of light. This electrochromic material can also be erased completely or selectively.

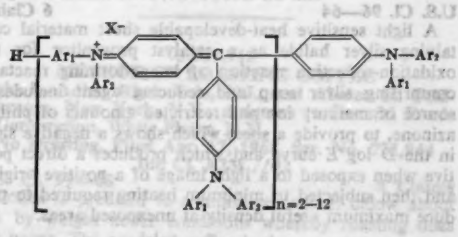
3,589,897

NOVEL ELECTROPHOTOGRAPHIC SENSITIZERS

Charles J. Fox and Arthur L. Johnson, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 447,937, Mar. 16, 1965, now Patent No. 3,387,973, and Ser. No. 687,503, Dec. 4, 1967, now Patent No. 3,488,705, which is a division of application Ser. No. 163,092, Dec. 29, 1961, now Patent No. 3,234,280. This application Mar. 18, 1968, Ser. No. 714,091
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.6 **19 Claims**

Compounds having the structure



are sensitizers for photoconductors in electrophotographic elements.

3,589,898

LITHO PLATE

Douglas James Fry and Brian Ronald David Whitear, Ilford, Essex, England, assignors to Polychrome Corporation, Yonkers, N.Y.

No Drawing. Filed Oct. 8, 1968, Ser. No. 765,960
Int. Cl. G03f *7/08*
U.S. Cl. 96—33 **4 Claims**

This application describes a positive working presensitised lithographic plate which comprises a support base having thereon a light-sensitive coating which comprises an O-naphthoquinone 1,2 diazide or an O-benzoquinone 1,2 diazide and dispersed throughout the coating a photochromic compound which on exposure to strong light changes to a colour the absorption of which is above 500 nm.

3,589,899

PHOTOGRAPHIC IMAGE REDUCTION METHOD

Seymour L. Hersh, Freehold, N.J., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed May 22, 1968, Ser. No. 731,313
Int. Cl. G03f 5/00; G03c 11/00
U.S. Cl. 96—45 3 Claims

Continuous tone images are optically converted to half tone images of a reduced size that is convenient for use in storage and retrieval systems. The quality and tonal gradations of the original continuous tone image are maintained in the reduced half tone film record. When desired, this reduced half tone record of original continuous tone image, may be reconstituted by suitable optical and/or photographic means to obtain an eye readable image of the original subject matter.

3,589,900

PHOTOSOLUBLE LAYER PROCESSING IN SILVER HALIDE SOLVENT SOLUTION IN PRESENCE OF REDUCING AGENTS

Ralph Kingsley Blake, Westfield, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 22, 1967, Ser. No. 684,924
Int. Cl. G03c 5/30
U.S. Cl. 96—64 14 Claims

Silver halide crystals of photosoluble silver halide layers, e.g., of the type defined in Blake 3,155,507, Nov. 3, 1964, are preferentially removed in exposed areas to form a positive silver halide image by a silver halide solvent solution in the presence of small amounts of a silver halide reducing agent and a Dmax maintaining agent. The photographic speed is increased.

3,589,901

METHOD OF MAKING A HEAT DEVELOPABLE SHEET CONTAINING MERCURY LENS

Thomas D. Lyons, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1968, Ser. No. 708,988
Int. Cl. G03c 5/24, 1/08
U.S. Cl. 96—64 6 Claims

A light sensitive heat-developable sheet material containing silver halide as a catalyst progenitor for the oxidation-reduction reaction of image-forming reactants comprising silver soap and reducing agent includes a source of mercury ion and restricted amounts of phthalazinone, to provide a sheet which shows a negative slope in the *D* log *E* curve and which produces a direct positive when exposed to a light image of a positive original and then subjected to minimum heating required to produce maximum useful density at unexposed areas.

3,589,902

PHOTOGRAPHIC DEVELOPER CONCENTRATE

Wolfgang Himmelmann, Cologne-Stammheim, and Helmut Mader, Karl-Otto Meyer, Heinz Sassmann, and Hans Schellenberger, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 13, 1966, Ser. No. 601,305
Claims priority, application Germany, Dec. 22, 1965, A 51,149
Int. Cl. G03c 5/30
U.S. Cl. 96—66 1 Claim

Developer concentrates having added copolymer of polyethylene glycol with an olefinically unsaturated carboxylic or sulfonic acid or added copolymer of a polyethylene glycol ester of an unsaturated carboxylic acid with a vinyl compound containing a carboxylic or sulfonic acid group. Such copolymers compensate for the contrast loss otherwise produced by a developer made by diluting an aqueous-organic solution of the developer concentrate.

3,589,903

SILVER HALIDE, HEAT-DEVELOPABLE IMAGE SHEET CONTAINING MERCURIC ION

Stephen P. Birkeland, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1968, Ser. No. 708,989
Int. Cl. G03c 1/76, 1/86, 1/78
U.S. Cl. 96—67 10 Claims

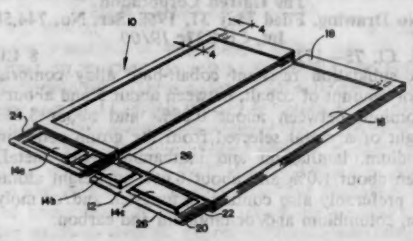
A light-sensitive heat-developable imaging sheet containing catalytic amounts of light-sensitive silver halide in catalytic association with organic silver salt oxidation-reduction image-forming means is given increased speed, stability and contrast by incorporation of mercuric ion.

3,589,904

PHOTOGRAPHIC FILM UNIT

Richard J. Chen, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 19, 1969, Ser. No. 851,290
Int. Cl. G03c 1/48
U.S. Cl. 96—76 10 Claims



A self-developing photographic film unit adapted to be processed by being moved between two pressure-applying rollers. A transparent sheet is held in face-to-face contact with the photosensitive sheet with a liquid processing composition being fed between the sheets and arranged so that excess processing liquid is collected after the photosensitive sheet has been covered and any air trapped with the processing liquid is allowed to escape. The escape means provided is an unsealed portion of a fold in the binding material that holds the sheets together.

3,589,905

INKING PROPERTIES OF MATTE-SURFACED POLYESTER SHEETING

Albert J. Reedy and Walter R. White, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Jan. 22, 1968, Ser. No. 699,323
Int. Cl. G03c 1/78
U.S. Cl. 96—87 3 Claims

The eraseability of matte-surfaced polyester sheeting useful in engineering drafting is significantly improved by laying down directly on the matte surface either a thin layer of a polymeric tergel or a two-layer configuration, the first layer being a terpolymer based on vinylidene chloride, an unsaturated ester, and an unsaturated carboxylic acid, and the second layer being a very thin gelatin layer.

3,589,906

PHOTOGRAPHIC LAYERS CONTAINING PERFLUORO COMPOUNDS AND COATING THEREOF

Maurice James McDowell, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 16, 1968, Ser. No. 768,169
Int. Cl. G03c 1/38
U.S. Cl. 96—87 8 Claims

Acrylic polymer layers and colloidal silver halide photographic emulsions are coated to form layers without repellent spots from solutions containing a perfluoro compound

containing an intralinear carbonyl or sulfonyl group selected from the group: (1) perfluorocarbon compounds derived from perfluorocarboxylic acids having the general structure

where C_f is a fully fluorinated (perfluoro) saturated chain consisting of five or more carbon atoms which may or may not be an oxygen-interrupted carbon chain; X=OY or an amino group, where Y is H, alkali metal or an ammonium group, and (2) perfluoro compounds derived from perfluorosulfonic and perfluorosulfuric acids having the general structure

$$(C_f)_x(C_H)_y(X)(Z)$$

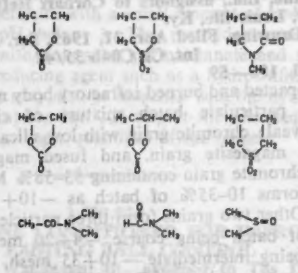
where C_f is a fully fluorinated carbon chain as defined in paragraph (1); C_H is the saturated hydrocarbon portion of the same carbon chain; X is SO_2 or SO_3; Z is an amino or hydroxyl group, alkali metal or an ammonium group; $x=6$ or greater; $y=2$ or more.

3,589,907

PHOTOSENSITIVE LACQUER AND THE USE OF THIS LACQUER IN MANUFACTURING PICTURE SCREENS FOR CATHODE-RAY TUBES

Rinse Dijkstra, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 2, 1967, Ser. No. 620,029
Claims priority, application Netherlands, Mar. 4, 1966, 6602796
Int. Cl. G03c 1/66
U.S. Cl. 96—93 4 Claims



Use of dipolar aprotic substances to increase photosensitivity of aqueous polyvinyl alcohol bichromate lacquers. Examples of the aprotic substances are ethylene carbonate and dimethyl acetamide. The lacquers are particularly useful in the attachment of colored phosphors to cathode-ray tubes for color television sets.

3,589,908

PHOTOGRAPHIC MATERIALS CONTAINING HYDROPHILIC COLLOIDS

James Plakunov, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 8, 1965, Ser. No. 506,831
Int. Cl. C03c 1/10
U.S. Cl. 96—107 17 Claims

Photographic emulsions having a binding agent comprising gelatin and at least two other hydrophilic colloids, one being carboxymethylated protein, exhibit improved photographic properties and are particularly useful when processed in automatic processing equipment. Photographic elements comprising silver halide and a layer having said binding agent upon a suitable support are also disclosed.

3,589,909

GUM CONFECTIONS CONTAINING DEXTROSE AND 5–15 D.E. STARCH HYDROLYSATE

Martin M. Godzicki and Bruce A. Kimball, Chicago, Ill., assignors to Corn Products Company

No Drawing. Filed Oct. 31, 1968, Ser. No. 772,367
Int. Cl. A23g 3/00
U.S. Cl. 99—134 12 Claims

Dextrose in combination with a starch hydrolystate having a D.E. of about 5 to 25 replaces sucrose in a gum confection to thereby reduce drying time and improve resiliency, strength, firmness, tenderness, and skin formation.

3,589,910

SYNTHETIC GRANULAR CAVIAR AND A METHOD OF PREPARING IT

Alexandr Nikolaevich Nesmeyanov, Leninskie Gory, MGU, korpus k, kv. 105; Sergei Vasilievich Rogozhin, Ulitsa Vavilova 55/5, kv. 52; Grigory Lvovich Slonimsky, Ulitsa Chkalova 1/4, kv. 16; Vladimir Borisovich Tolstoguzov, B. polyanka 34, kv. 6; and Vera Alexandrovna Ershova, Staro-Konjushenny pereulok 14, kv. 1, all of Moscow, U.S.S.R.

No Drawing. Filed Mar. 1, 1967, Ser. No. 619,599
Int. Cl. A23j 3/00
U.S. Cl. 99—14 10 Claims

A synthetic caviar produced by mixing a solution or a suspension of edible proteins with gelatin, dropping the mixture into a water immiscible liquid to form jelly-like granules and treating the granules with a tanning agent.

3,589,911

PRESSURE ROASTING OF COFFEE BEANS

Herman H. Friedman, Bayside, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed Feb. 7, 1968, Ser. No. 703,525
Int. Cl. A23f 1/02
U.S. Cl. 99—68 3 Claims

Coffee is roasted at pressures of about 1000 p.s.i.g., or above, in the presence of an atmosphere having a lowered oxygen content.

3,589,912

METHOD OF ROASTING COFFEE

Irwin L. Adler, River Vale, N.J., and Alonzo H. Feldbrugge, New York, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed Apr. 17, 1968, Ser. No. 721,944
Int. Cl. A23f 1/02
U.S. Cl. 99—68 5 Claims

Coffee is predried to a moisture content below about 7% by weight under conditions whereby roasting does not occur. The predried coffee is then roasted at a temperature below the critical burning temperature until a substantial part of the roasting is completed. The coffee is next further heated to bring its temperature to the critical burning temperature for a brief period, then rapidly quenched.

3,589,913

METHOD OF MAKING CONNECTED PACKAGES

Harry Rosenberg, Philadelphia, Pa., assignor to New Jersey Machine Corporation, Hoboken, N.J.

Filed Oct. 20, 1965, Ser. No. 498,354
Int. Cl. B65f 29/02
U.S. Cl. 99—77.1 10 Claims

Connected packages are formed by a two stage sealing process. A material receiving chamber is formed in the first stage by completely forming an inner seal and partially forming an outer peripheral seal. The chamber is filled with material such as coffee. The outer peripheral seal is then completed as the first stage seals are made in

the next succeeding package. A saw tooth cutter is employed to weaken the area between adjacent packages and to completely sever a predetermined number of them.

3,589,914
CRISP, BACON FLAVORED CHIPS AND FOODS CONTAINING THEM
Irwin Cooper, Staten Island, N.Y., and Daniel Melnick, West Englewood, N.J., assignors to CPC International Inc.
Continuation-in-part of application Ser. No. 580,036, Sept. 16, 1966. This application Feb. 16, 1967, Ser. No. 616,617
Int. Cl. A23l *1/10*
U.S. Cl. 99—83 7 Claims

Edible, crisp chips are flavored and colored to simulate bacon, and may be in the form of flakes or strips. They are made from a flour-based dough and may be incorporated into other foods such as peanut butter.

3,589,915
PRECOOKED PORK SAUSAGE
David E. Lustig, New Hope, Pa., assignor to Devro, Inc., Somerville, N.J.
Filed Mar. 12, 1969, Ser. No. 806,485
Int. Cl. A23b *1/04*
U.S. Cl. 99—109 8 Claims

A precooked pork sausage characterized by an extruded collagen casing is provided which may be recooked for serving in three to five minutes (from the thawed state) and in eight to ten minutes (from the frozen state).

3,589,916
AUTOCATALYTIC GOLD PLATING SOLUTIONS
John F. McCormack, Roslyn Heights, N.Y., assignor to Photocircuits Corporation, Glen Cove, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 768,575, Aug. 20, 1968, which is a continuation-in-part of abandoned application Ser. No. 377,509, June 24, 1964. This application Nov. 14, 1969, Ser. No. 877,052
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 9 Claims

Improved electroless gold plating baths are provided by formulating in aqueous alkaline media, a water soluble gold salt; a complexing agent for gold, a water soluble borohydride or amine borane reducing agent for gold, and a small effective stabilizing amount of a cyanide compound in an amount of between about 5 micrograms and 500 milligrams.

3,589,917
CONCRETE RESISTANT TO SCALING AND SPALLING
Robert C. Hedlund, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed Aug. 15, 1967, Ser. No. 660,608
Int. Cl. C09k *3/00*
U.S. Cl. 106—12 22 Claims

The surface of concrete is treated with a silane or a siliconate before it becomes finally set. In the preferred embodiment, evaporation of the water from the concrete is controlled by conventional methods such as the use of membrane curing compounds. The resulting concrete is resistant to scaling and spalling.

3,589,918
OPTICAL GLASS AND PROCESS FOR ITS MANUFACTURE
Walter Jahn, Ingelheim, Germany, assignor to JENAer Glaswerk Schott & Gen., Mainz, Germany
No Drawing. Filed Nov. 1, 1968, Ser. No. 773,374
Claims priority, application Germany, Nov. 14, 1967, P 15 96 864.6
Int. Cl. C03c *3/04*
U.S. Cl. 106—53 15 Claims

Optical glass compositions comprising 25 to 65 wt. percent SiO_2, 4–35 wt. percent K_2O, 4–45 wt. percent TiO_2 and 3–45 wt. percent Sb_2O_3, characterized in that the minimum content of TiO_2 plus Sb_2O_3 amounts to 18 wt. percent.

3,589,919
BURNED BASIC REFRACTORY AND BATCH THEREFOR
Michael A. Nelson, Jeffersonville, Ind., Robert F. Patrick, Louisville, Ky., and Thomas M. Wehrenberg, Jeffersonville, Ind., assignors to Corhart Refractories Company, Louisville, Ky.
No Drawing. Filed Apr. 21, 1969, Ser. No. 818,095
Int. Cl. C04b *35/42*
U.S. Cl. 106—59 9 Claims

Compacted and burned refractory body made from size-graded particulate batch mixture of chemical grade (Transvaal) chromite grain with low-silica content, dead-burned magnesite grain, and fused magnesia-chemical grade chromite grain containing 53–58% MgO. Chromite grain forms 10–35% of batch as −10+150 mesh particles. Other two grains form three particle fractions: 30–60% of batch being coarse −4+20 mesh, 0–30% of batch being intermediate −10+35 mesh, and fine magnesite grain is at least 10% of batch. The total +28 mesh particles of chromite grain and magnesite grain constitute 4 to less than 50% of batch. Body burned at about 1600° C. characterized by modulus of rupture at 1340° C. consistently above 1700 p.s.i. and as high as 2000 p.s.i. or higher.

3,589,920
PROCESS FOR MANUFACTURING LOW ALKALI CEMENTS
Werner Ostberg and Terry Patzias, Ann Arbor, Mich., assignors to Dundee Cement Company, Dundee, Mich.
Continuation-in-part of abandoned application Ser. No. 648,238, June 23, 1967. This application Nov. 17, 1969, Ser. No. 877,244
The portion of the term of the patent subsequent to Apr. 8, 1986, has been disclaimed
Int. Cl. C04b *7/02, 7/42*
U.S. Cl. 106—100 3 Claims

This application relates to producing low alkali portland cements by adding dry, pulverized lime to the burning zone of the cement clinker forming kiln, to react with the cement raw materials and thereby convert the alkali contents thereof into non-corrosive, alkali vapors, which are removed as a gas, thereby reducing the alkali content of the cement clinker.

3,589,921

POLYSULFONATED BIS-S-TRIAZINYLAMINO-STILBENE-2,2'-DISULFONIC ACIDS

Robert Corwin Allison, Yonkers, N.Y., and Franz Fischer, Basel, and Heinrich Hausermann, Riehen, Switzerland, assignors to Geigy Chemical Corporation, Greenburgh, N.Y.

No Drawing. Filed Mar. 18, 1969, Ser. No. 844,682
Int. Cl. C09b 23/00
U.S. Cl. 106—137 6 Claims

New polysulfonated bis-s-triazinylamino-stilbene-2,2'-disulfonic acids and their salts, in the molecules of which each triazine ring is substituted at a first ring carbon atom by disulfophenyl-amino, and at a second ring carbon atom by a substituted amino group the substituents of which are free from sulfonic acid radicals; these compounds are useful especially as brighteners in the surface coating of paper, imparting high white maxima thereto; paper surface-coated with coating mixtures containing such novel compounds, a method for optical brightening of cellulosic fibers, especially cotton, by continuous pad dyeing type processes with or without the use of precondensates for wash-and-wear resin finish in the pad liquor; and compositions containing such compounds, for use in the above brightening methods.

3,589,922

METHODS FOR BLEACHING GRAY KAOLIN CLAY

Bernard K. Asdell, McIntyre, and Miller B. Mallary, Macon, Ga. assignors to Engelhard Minerals & Chemicals Corporation, Township of Woodbridge, N.J.

No Drawing. Filed Oct. 31, 1967, Ser. No. 679,556
Int. Cl. C09c 1/42
U.S. Cl. 106—288B 6 Claims

Gray kaolin clay from Georgia (so-called "hard" clay) is bleached by treatment of an aqueous slip of the clay at elevated temperature with a small amount of hydrogen peroxide at a pH below 3. The peroxide-treated slip is then treated with potassium permanganate and subsequently with a reducing agent such as a hydrosulfite salt. This type of clay may also be bleached with the hydrogen peroxide per se at the low pH and at the elevated temperature by using larger quantities of the reagent.

3,589,923

BOWLING LANE CONDITIONER FOR IMPROVED AND LASTING BALL CONTROL

Alex H. Stein, Waukegan, Ill., assignor to The Dexter Corporation and Brunswick Corporation, jointly

No Drawing. Filed Oct. 24, 1967, Ser. No. 677,725
Int. Cl. C09d 7/12
U.S. Cl. 106—285 3 Claims

A bowling lane conditioner is disclosed which comprises mineral oil, from about 0.2 to 5% by weight of a surfactant such as polyoxyalkylene alkyl ether, and from about 2.0 to about 24% by weight of a coupling agent such as isocetyl stearate. The conditioner is dissolved in a solvent system which advantageously includes a lower alkyl monohydric alcohol.

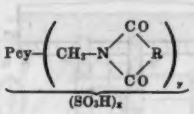
3,589,924

NON-CRYSTALLIZING, NON-FLOCCULATING PHTHALOCYANINES

Vito Albert Giambalvo, Middlesex, and William Lee Berry, Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 623,809, Mar. 17, 1967. This application June 23, 1970, Ser. No. 49,170
Int. Cl. C08h 17/14
U.S. Cl. 106—288Q 2 Claims

A non-flocculating, non-crystallizing phthalocyanine pigment composition is formed by a mixture of 60–95% of a crystallization, flocculation susceptible phthalocyanine pigment and about 5–40% of a sulfonated phthalimidomethyl phthalocyanine derivative represented by the formula:



wherein Pcy is a phthalocyanine radical, R is a phenylene radical, x is 0.2 to 2.5, y is 0.6 to 2.1, and $x+y$ is not greater than 3.0.

3,589,925

CERAMIC PIGMENTS

Bernard Trevor Bell, Trentham, Stoke-on-Trent, England, assignor to Johnson, Matthey & Co. Limited, London, England

Filed Dec. 22, 1967, Ser. No. 693,026
Claims priority, application Great Britain, Dec. 22, 1966, 57,441/66
Int. Cl. C09c 1/28
U.S. Cl. 106—299 11 Claims

The invention relates to ceramic pigments. Zircon based ceramic pigments may be prepared by calcining mixtures comprising zirconium and silicon oxide (or compounds capable of yielding these materials on calcination) in the presence of a chromophore and one or more mineralizer components, the proportions of zirconium oxide and silica in the mixture being such that zirconium silicate is formed on calcination.

It is known, for example, that blue and yellow pigments may be formed by calcining mixtures of the type described above in which the colouring agents are, respectively, vanadium pentoxide and praseodymium oxide and in which, in each case, mineralizer components comprising sources of alkali metal ions, fluoride ions and either chloride or bromide ions are employed.

We have now discovered that ceramic pigments of still further enhanced colour strength may be formed by calcining mixtures of the type described above, in which the mineralizer components comprise, a source of barium ions, in addition to sources of alkali metal ions, fluoride ions and either chloride or bromide ions.

3,589,926

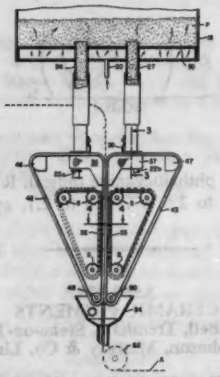
METHOD OF COATING THE ENDS OF ELONGATED BODIES AND THE APPARATUS THEREFOR

William G. Eckert, Massapequa Park, Armando Araujo, Freeport, and Frank D. Jonas, Upper Brookville, N.Y., assignors to Oxford Filing Supply Co., Inc., Garden City, N.Y.

Continuation of application Ser. No. 432,251, Feb. 12, 1965. This application Feb. 18, 1969, Ser. No. 817,214
Int. Cl. B44d 1/094
U.S. Cl. 117—21 10 Claims

A method and apparatus for coating the ends of elongated members, particularly file folder hanger rods, with plastic material which is firmly bonded thereto to provide for easy sliding action on the cooperating suspension rods. The hanger rods are advanced along a path extending transverse to their axes and after being conditioned as by heating to cause powdered plastic material to adhere thereto, the ends of the rods are caused to enter between pairs of porous belts having compressible edges, which belts carry powder which is thus pressed against the rod

ends and adheres thereto. The powder is taken from fluidized beds and flows as a liquid onto the porous belts,



being retained thereon by suction which also serves to remove air and compact the powder material.

3,589,927

CHROMISING OF FERROUS METAL SUBSTRATES

Kenneth Urmston Holker, Harrogate, and Colin Wells, Horsforth, Leeds, England, assignors to Albright & Wilson Limited, Oldbury, England

No Drawing. Continuation of abandoned application Ser. No. 561,327, June 29, 1966. This application Sept. 2, 1969, Ser. No. 856,884

Claims priority, application Great Britain, July 1, 1965, 27,956/65

Int. Cl. C23c *9/00*

U.S. Cl. 117—22 **13 Claims**

This invention provides a process for chromising ferrous metal substrates. A porous adherent chromium-containing coating is applied to the surface of a ferrous metal substrate. The coated substrate is then heated in contact with a gaseous stream containing a hydrogen halide and also hydrogen and/or in inert gas to a temperature such that the hydrogen halide reacts with the surface of the coated substrate said temperature being below that at which any appreciable amounts of the resultant metal halides would be removed therefrom by evaporation. The flow of the gas is then stopped and the coated substrate heated to a temperature of a least 750° C. for a period sufficient to alloy the chromium in the initial coating with the substrate and form an alloy coating of the desired thickness.

3,589,928

PROCESS FOR THE PRODUCTION OF A LIGHT SENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY

Iwao Sawato and Katsuo Makino, Odawara-shi, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan

Filed Aug. 4, 1966, Ser. No. 570,292

Claims priority, application Japan, Aug. 4, 1965, 40/47,045

Int. Cl. G03c *1/00*

U.S. Cl. 117—34 **6 Claims**

A light sensitive material suitable for electrophotography and the method for producing the material. Admixed in aqueous solution are a cadmium ion which is selected from the group consisting of cadmium halide, cadmium sulphate and cadmium nitrate; a carbonate ion which is selected from the group consisting of sodium carbonate, potassium carbonate and ammonium carbonate; and a sulfide ion which is selected from the group consisting of sodium sulfide, ammonium sulfide and hydrogen sulfide. Further, a selenide may displace the sulfide ion. A precipitate is thus formed which is thereafter calcined at a temperature less than about 400° C.

3,589,929

PROCESS FOR MANUFACTURE OF POROUS SHEET MATERIAL AND A POROUS SHEET HAVING A TEXTILE SUBSTRATE

Cornelis A. Smolders, Velp Gelderland, and Joseph T. V. M. Geusgens, Dieren Gelderland, Netherlands, assignors to Algemene Kunstzijde Unie N.V., Arnham, Netherlands

No Drawing. Filed May 13, 1968, Ser. No. 728,753

Claims priority, application Netherlands, May 18, 1967, 6706867

Int. Cl. B29d *27/04*; B44d *1/44*

U.S. Cl. 117—63 **9 Claims**

A process for the manufacture of a porous sheet material which comprises the steps of applying a liquid homogeneous mixture of a polymer, e.g., a polyurethane, and an auxiliary substance, e.g., caprolactam, to a substrate, cooling the mixture to a temperature at which there is formed a solid phase substantially comprising the polymer, the auxiliary substance comprising a solvent for the polymer which upon cooling of the mixture precipitates from the mixture into a separate solid phase before the formation of the solid polymer phase is completed, and thereafter removing the auxiliary substance to form a homogeneous uniform porous sheet material.

3,589,930

PROCESS FOR THE PREPARATION OF NON-WOVEN FABRICS

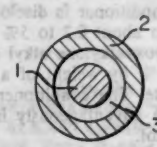
Toshikazu Shinohara, Hiroshi Hattori, and Makoto Kounosu, Ohtsu-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed June 24, 1968, Ser. No. 739,556

Claims priority, application Japan, June 27, 1967, 42/40,723

Int. Cl. B44d *1/44*

U.S. Cl. 117—63 **9 Claims**



Non-woven fabrics having excellent softness and flexural resistance are prepared by applying an aqueous solution of at least one water-soluble, high molecular substance to a fibrous web, drying the same applying to the dried web a binder solution composed of at least one binder dissolved in a solvent which is a non-solvent to the fibers constituting the fibrous web as well as to the water-soluble, high molecular substance, solidifying the binder solution thereby fixing the binder on the web, and thereafter dissolving and removing the water-soluble, high molecular substance from the web.

3,589,931

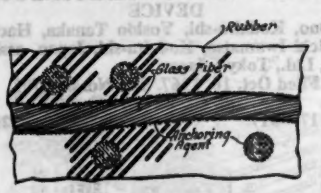
STRUCTURES FORMED OF GLASS FIBER-ELASTOMER SYSTEMS

Alfred Marzocchi, Cumberland, and Nicholas S. Janetos, Providence, R.I., assignors to Owens-Corning Fiberglas Corporation

Continuation of application Ser. No. 714,297, Mar. 19, 1968, which is a division of application Ser. No. 470,407, July 8, 1965, now Patent No. 3,387,900, which in turn is a division of application Ser. No. 750,253, July 22, 1958. This application Sept. 30, 1969, Ser. No. 863,037

Int. Cl. C03c *25/02*; B32b *17/04*

U.S. Cl. 117—72 3 Claims



A cured elastomeric product reinforced with glass fibers embedded within the cured elastomeric material and in which the bonded relationship between the glass fiber reinforcement and the elastomeric material is enhanced by a coating applied to the glass fiber surfaces prior to the combination with the elastomeric material in which the coating consists of an organic compound that forms a weak basic solution in water and reacts with the glass fiber surfaces to introduce a positive charge and has a nitrogen group in the form of an amino group and which may include in combination therewith an amino silane or unsaturated silane.

3,589,932

PROCESS OF COATING METAL SUBSTRATES AND RESULTING COATED METAL SUBSTRATES

Harold A. Wittcoff and Kenneth B. Stokes, Minneapolis, Minn., assignors to General Mills, Inc.

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,124

Int. Cl. B44d *1/14, 1/34*

U.S. Cl. 117—75 11 Claims

A composite coating of improved chip resistance is prepared by coating a metal substrate with a composition comprising an organic polyisocyanate and a ketimine or aldimine blocked polyamine or organic isocyanate derivative thereof and then with a heat curable acrylic coating composition. At least 5% of the isocyanato groups of the reactants in the first coating composition must be from the polyisocyanates prepared from polymerized fat acids.

3,589,933

SUSPENSION SYSTEMS FOR VEHICLES

Robert Hazell Pitcher, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, England

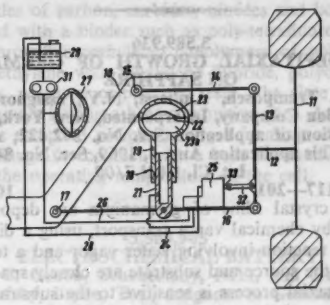
Filed Aug. 5, 1968, Ser. No. 757,187

Claims priority, application Great Britain, Aug. 16, 1967, 37,582/67

Int. Cl. B60g *21/06*

U.S. Cl. 280—112 4 Claims

Control means for controlling a vehicle suspension system so as to maintain the vehicle body at a substantially constant mean height despite load variations and to oppose tilting due to horizontal forces in at least one direction (roll or pitch) in which a plurality of fluid-containing struts supporting the body have their fluid content controlled by control units each comprising a spool valve capable of connecting the appropriate strut to a source of fluid pressure or a drain and a valve control linkage operated by wheel displacement relative to the vehicle body, the linkage including a first component movable by relative wheel-to-body movement, a second component coupled to the valve spool and a weight suspended from the first component and connected below its suspension pivot to the second component.



3,589,934

PROCESS FOR COLORING GLASS FIBERS

Karl F. Schimmel, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Sept. 26, 1968, Ser. No. 762,986

Int. Cl. C03c *25/02*

U.S. Cl. 117—76 8 Claims

This invention relates to a method of dyeing textile fibers comprising glass fibers. The process of this invention comprises coating a glass textile fiber or fabric with an adherent coating of an interpolymer comprising a non-rubbery interpolymer of a polyunsaturated hydrocarbon monomer and at least one monoolefin monomer having a single copolymerizable ethylenic group, said interpolymer having an essentially saturated carbon chain containing a substantial proportion of the total carbon atoms in the polymer molecule and containing sufficient ethylenically unsaturated groups in the polymer molecule to permit substantial curing of films thereof by oxidative mechanism, then contacting the coated fiber with an organic dye, preferably a dye selected from the group consisting of disperse dyes, cationic dyes, and premetallized dyes.

3,589,935

DIFFUSION COATING OF METALS

Harry Brill-Edwards and Kenneth K. Speirs, both of 4430 Director Drive, San Antonio, Tex. 78219

No Drawing. Filed May 31, 1968, Ser. No. 733,287

Int. Cl. C23c *11/02*

U.S. Cl. 117—107.2 5 Claims

In pack impregnation or cementation processes for the diffusion coating of one or more metals into the surface of metal articles, improved techniques and compositions are provided for the diffusion coating of metals such as aluminum and antimony into the surface of a variety of ferrous and other metal articles embedded in a powdered coating pack at coating temperatures considerably lower (by as much as 200° F.) than those temperatures required by conventional techniques to provide effective diffusion coating of the same materials. This is accomplished by providing in the coating pack an accelerating component (such as either relatively volatile metals as cadmium, lead, zinc, etc., or certain long chain organic compounds) which do not ultimately form a substantial or significant part of the diffusion coating, but do act in the coating pack to accelerate the diffusion of the coating metals into the articles being coated at lower temperatures to achieve increased coating deposition at a given temperature and/or satisfactory coating deposition at temperatures lower than

otherwise obtainable, and permitting satisfactory coatings at temperatures below those at which some undesired crystallographic or metallographic or physical property change would occur in the metal articles being coated.

3,589,936

HETEROEPITAXIAL GROWTH OF GERMANIUM ON SAPPHIRE

Ralph F. Tramposch, Amherst, N.Y., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Continuation of application Ser. No. 542,422, Apr. 13, 1966. This application Aug. 4, 1969, Ser. No. 849,583

Int. Cl. H01l *7/00*

U.S. Cl. 117—201 **10 Claims**

Single crystal films of germanium are deposited on sapphire by chemical vapor transport, using a disproportionation reaction involving water vapor and a technique in which the source and substrate are closely spaced. The heteroepitaxial process is sensitive to the substrate orientation, the substrate temperature, and also to the impurity level in the source material. Monocrystalline and highly oriented films of germanium on sapphire have been produced through this process. The films are useful in the preparation of electronic devices.

3,589,937

METHOD OF PRODUCING ELECTRIC SHUNTS FOR BRIDGING P-N JUNCTIONS IN SEMICONDUCTORS

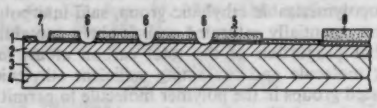
Kurt Raithel, Uttenreuth, and Rene Rosenheinrich, Ebermannstadt, Germany, assignors to Siemens Aktiengesellschaft

Filed Feb. 10, 1967, Ser. No. 615,111

Claims priority, application Germany, Feb. 12, 1966, S 101,984

Int. Cl. H01l *7/02, 7/50;* H05k *3/06*

U.S. Cl. 117—212 **3 Claims**



Method of producing electric shunts for bridging p-n junctions in semiconductor bodies. A foil is placed on a semi-conductor body. This foil contains perforations in pattern. Surface of semiconductor body is etched away through perforations until p-n junction is destroyed.

3,589,938

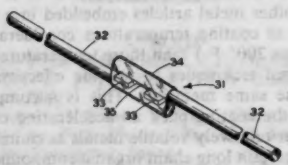
METHODS FOR APPLYING LIQUID TO ARTICLES WITHOUT TOUCHING THE ARTICLES

John H. Blewett, Reading, and Harry K. Naumann, Wernersville, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed July 11, 1968, Ser. No. 744,082

Int. Cl. B05c *1/00, 3/00, 3/02*

U.S. Cl. 117—212 **5 Claims**



Coating fluid is applied to an article, without contacting a body of the article with means other than the fluid to be applied. An applicating member, having at least one tooth with a concavity therein, is dipped into a bath of coating fluid, retracted and fluid retained in and about the concavity by capillarity. The member is then brought into noncontacting relation with the article so that a portion of the article lies within the fluid-filled concavity. A quantity of fluid within the concavity contacts and flows about the article, coating it. Simultaneous coating of a plurality of paramagnetic-leaded electrical devices utilizes magnetic holding of the devices, during the coating process, and an applicator with a plurality of spaced teeth arranged in a comblike array.

3,589,939

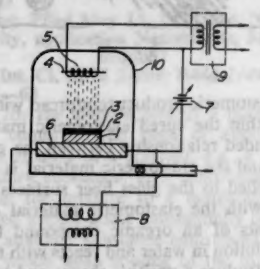
METHOD OF MAKING A SEMICONDUCTOR DEVICE

Minoru Ono, Kodaira-shi, Yoshio Tanaka, Hachioji-shi, and Seiichi Iwamatsu, Kodaira-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1967, Ser. No. 675,702

Int. Cl. B44d *1/18*

U.S. Cl. 117—217 **25 Claims**



A method of making a stabilized semiconductor device, wherein a semiconductor substrate covered with an insulating film such as a silicon oxide film is heated to a temperature not breaking the components thereof and an electrode metal e.g. aluminum, endowed with a predetermined electric potential with respect to the substrate, is evaporated to deposit an electrode metal layer on the surface of the film.

3,589,940

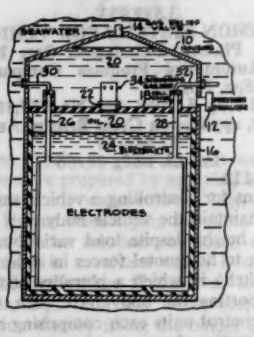
DEEP SUBMERGENCE BATTERY HAVING GAS BUBBLE-ELECTROLYTE SCRUBBING VENT CAP

Laurence Bridge, Cornwell Heights, Walter J. Horner, Willow Grove, and Harold F. Thiel, Cornwell Heights, Pa., assignors to ESB Incorporated

Continuation-in-part of application Ser. No. 762,893, Sept. 26, 1968. This application Apr. 14, 1970, Ser. No. 28,366

Int. Cl. H01m *1/06*

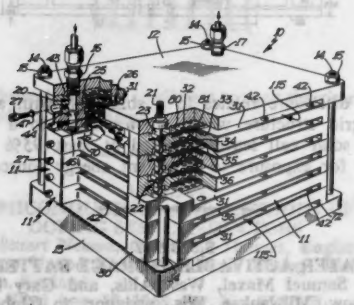
U.S. Cl. 136—6 **6 Claims**



A pressure equalized deep submergence battery for immersion in a salt or fresh water medium having an oil-

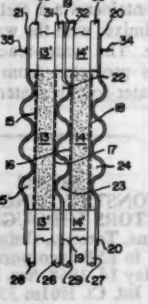
electrolyte interface beneath the cell cover is provided with a vent cap in the cover which scrubs drops of electrolyte from the discharge gas bubbles as they pass through the cell.

3,589,941
FUEL CELL WITH INTERNAL MANIFOLDS
James J. Eaton, Minneapolis, and Donald W. Tschida, St. Paul, Minn., assignors to Onan Corporation
Filed Feb. 24, 1969, Ser. No. 801,320
Int. Cl. H01m 27/00
U.S. Cl. 136—86 **9 Claims**



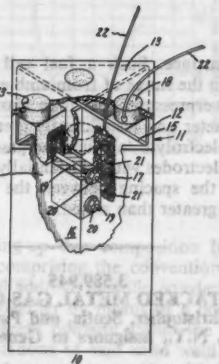
A fuel cell battery consisting of a plurality of associated duplex cells. Each duplex cell is mounted on a single frame which defines an integrally formed fuel input manifold, exhaust manifold, anode terminal manifold, and cathode terminal manifold. Valve means is provided to individually regulate the fuel input to each duplex cell. A plurality of duplex cells may be associated in a highly convenient and efficient manner due to the mating design of the manifolds. Adjacent duplex cells may be electrically connected in series or in parallel with a minimum of adaptation or conversion of individual duplex cells.

3,589,942
BIPOLAR COLLECTOR PLATES
Frank B. Leitz, Jr., Weston, Mass., and Donald K. Fleming, Park Ridge, Ill., assignors to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa., Southern California Gas Company and Southern Counties Gas Company of California, both of Los Angeles, Calif., fractional part interest to each
Filed Dec. 22, 1966, Ser. No. 603,801
Int. Cl. H01m 27/00
U.S. Cl. 136—86 **12 Claims**



A bipolar collector plate having vertically oriented ridges and grooves that are hemispherical in cross-section. The adjoining ridges are connected by cross-grooves of a lesser depth than the vertical ridges and grooves. The range of radius of curvature of the ridges is critical and varies between 0.25 and 0.01 inch. The plates may be of a single material, preferably columbium, tantalum, stainless steel or nickel, or may be of a composite material such as particles of carbon, carbides, nitrides and borides impregnated with a binder such as poly-tetrafluoroethylene, poly-chlorotrifluoroethylene, copolymers of poly-chlorotrifluoroethylene with vinylidene fluoride, polyolefins, or an epoxy, polyester or phenolic resin. The plate may also be a laminate having a heat conductive core. An embodiment has extended peripheral edges forming a heat conductive flange for contact with a heat conductive fluid to control the operating temperature of the cell.

3,589,943
ELECTROCHEMICAL BATTERY
Willard T. Grubb, Schenectady, N.Y., and Herman A. Liebhafsky, Bryan, Tex., assignors to General Electric Company
Filed Aug. 29, 1968, Ser. No. 756,143
Int. Cl. H01m 27/02
U.S. Cl. 136—86 **5 Claims**

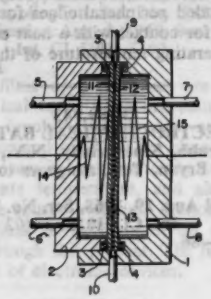


An electrochemical battery has a plurality of individual, fluid-tight fuel-electrolyte chambers in each of which an anode and a gas diffusion cathode mounted therein are connected electrically to the respective gas diffusion cathode and anode of adjacent cells. The electrolyte containing dissolved fuel in each cell is separated from adjacent cells thereby eliminating load paths across cells. Such a battery provides a high voltage output from a compact device.

3,589,944
FUEL CELLS AND THEIR METHOD OF OPERATION
Douchan Stanimirovitch, 68 Rue Lecourbe, Paris XV, France; Jean François Laurent, 12 Rue Victor Hugo, 86 Poitiers, France; and Patrice Robert Jean Verrez, deceased, late of La Roche-sur-Yon, France, by Denise Lucie Henriette Verrez, 28 Rue Anatole France, 85 La Roche-sur-Yon, France.
Continuation of application Ser. No. 599,789, Dec. 7, 1966, which is a continuation-in-part of application Ser. No. 62,148, Oct. 12, 1960. This application June 10, 1969, Ser. No. 847,769
Claims priority, application France, Oct. 16, 1959, 807,755, Patent 1,363,851; May 16, 1960, 827,419 (addition 83,404); June 18, 1960, 830,590 (addition 86,001)
Int. Cl. H01m 27/00, 27/02
U.S. Cl. 136—86R **13 Claims**

A fuel cell adapted for operation with a reducing gas and an oxidizing gas and a circulating liquid aqueous electrolyte constructed of porous gas-diffusion positive

and negative electrodes with the major, generally planar, surfaces of the electrodes of opposing polarity in contact with such electrolyte and spaced apart at a distance less than the maximum thickness of the ionic diffusion layer of such electrolyte, e.g., about 0.05 to about 0.5 mm., with the oxidizing and reducing gases being supplied to their respective electrodes at the surface thereof opposite



such major surface. Such a fuel cell is operable at a temperature in the range of from ambient to about 70° C. and at gas overpressures less than about 1 kilogram per square centimeter and insufficiently greater than the pressure on the electrolyte to cause the gases to pass entirely through the electrodes with substantially reduced polarization than if the spacing between the electrodes' major surfaces was greater than stated.

3,589,945

STACKED METAL GAS-CELLS

Harold A. Christopher, Scotia, and Paul J. Moran, Ballston Lake, N.Y., assignors to General Electric Company

Original application Oct. 30, 1967, Ser. No. 679,147. Divided and this application Aug. 21, 1969, Ser. No. 851,856

Int. Cl. H01m *29/04*

U.S. Cl. 136—86 **1 Claim**

An electrochemical cell has a first electrode and a second electrode, an aqueous electrolyte positioned between and in contact with the electrodes, and at least one of the electrodes is a gas diffusion electrode immersed partially in the electrolyte and the remaining portion of the electrode exposed to a gaseous medium. A modified electrochemical cell has a casing with an aqueous electrolyte therein, a first electrode in contact with the electrolyte, a second electrode in contact with the electrolyte and spaced from the first electrode, and at least one of the electrodes is a gas diffusion electrode immersed partially in the electrolyte and the remaining portion of the electrode exposed to a gaseous medium. For example, such cells are operated as metal-air cells, metal-fuel cells, and fuel cells.

3,589,946

SOLAR CELL WITH ELECTRICAL CONTACT GRID ARRANGEMENT

Krishan S. Tarneja, Pittsburgh, Pa., and Vito A. Rossi, Hawthorne, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 6, 1968, Ser. No. 758,075

Int. Cl. H01l *5/02*

U.S. Cl. 136—89 **10 Claims**

This disclosure relates to a solar cell with an electrical grid structure which when affixed to a surface of the solar cell leaves exposed at least 95% of the surface for exposure to a radiant energy source.

3,589,947

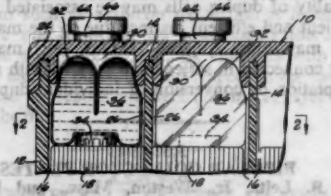
WATER ACTIVABLE STORAGE BATTERY

Walter Samuel Maxel, West Allis, and Gary Milborn Ginnow, Milwaukee, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Feb. 19, 1970, Ser. No. 12,810

Int. Cl. H01m *21/00*

U.S. Cl. 136—114 **17 Claims**



A water-activable storage battery having a container, storing a measured amount of concentrated electrolyte, positioned above the battery elements and a container-opening assembly, which includes a water-reactive material capable of releasing sufficient heat upon reacting with water added to the battery to melt or burn a discharge opening into the container. The concentrated electrolyte drains from the container via a metering device at a controlled rate and admixes with the water to provide the operating electrolyte. The water-reactive material, preferably potassium, is protected from oxdiation by a protective film of a water-soluble material.

3,589,948

METHOD OF CONSTRUCTING BATTERY INTER-CELL CONNECTORS THROUGH THE PARTITION

William D. Adams, Toronto, Ontario, Canada, assignor to ESB Incorporated

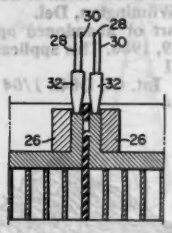
Filed May 14, 1968, Ser. No. 729,088

Int. Cl. H01m *35/10*

U.S. Cl. 136—134 **6 Claims**

The tops of risers extending upward on both sides of the container partition from the connecting straps are melted. The molten riser material flows into a hole in the partition where it is chilled to produce an intercell con-

nector. Melting is done by any suitable energy source, such as electrical induction, heat conduction, passing a



current through the risers sufficient to melt the riser material, or with a torch flame.

3,589,949

SEMICONDUCTORS AND METHODS OF DOPING SEMICONDUCTORS

Richard Stuart Nelson, Goring-on-Thames, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 18, 1969, Ser. No. 850,718
Claims priority, application Great Britain, Aug. 22, 1968, 40,308/68
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 9 Claims

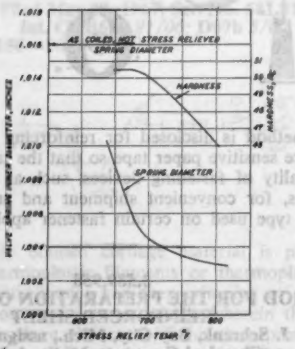
A region of semiconductor material is doped by bombarding the region with dopant ions, additionally bombarding the region with non-dopant ions, and annealing the region. The additional bombardment, especially if sufficient to form the region into an amorphous condition, which is recrystallised by the anneal, improves the absorption of the dopant ions into active substitutional sites in the lattice.

3,589,950

VALVE SPRING PROCESSING

William M. Justusson, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 21, 1969, Ser. No. 817,982
Int. Cl. C21d *1/18, 9/02*
U.S. Cl. 148—12 2 Claims



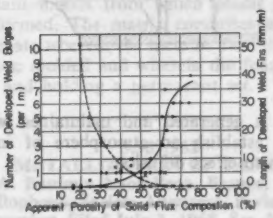
Coiled steel internal combustion engine valve springs are produced by hardening carbon steel wire, tempering the hardened wire to an Rc hardness of 50 to 51 at about 700° F., coiling the tempered wire into springs, and then stress relieving the coiled springs at a temperature above the tempering temperature and to a hardness not significantly greater than Rc 47. This results in a spring steel of definitely higher resistance to relaxation in service.

3,589,951

SOLID WELD BACKING-UP FLUX COMPOSITIONS

Masayasu Arikawa and Motomi Kano, Fujisawa-shi, and Hitosi Shioyama and Toshihiko Okamoto, Kamakura-shi, Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Mar. 2, 1967, Ser. No. 620,113
Claims priority, application Japan, Mar. 5, 1966, 41/13,432
Int. Cl. B23k *35/00*
U.S. Cl. 148—24 3 Claims



Solid weld backing-up flux composition for one side welding operation comprising the conventional principal flux components and additive metallic powder or powders which are bonded together by means of a bonding agent and having the apparent porosity within the range from 25 to 60%. Combinations of said solid weld backing-up flux composition and support means therefor for one side welding operation comprising the flux composition secured to a flexible sheet, sandwiched between fibrous sheets or received in a metallic casing with at least one area of the flux composition exposed.

3,589,952

SLURRY FOR BRAZING METAL SURFACES

Frederick A. Burne, Hamden, Conn., assignor to Olin Mathieson Chemical Corporation

No Drawing. Filed July 5, 1968, Ser. No. 742,527
Int. Cl. B23k *35/30*
U.S. Cl. 148—24 7 Claims

An improved method for brazing cuprous or ferrous surfaces utilizing an admixture of brazing powder and certain hydroxy-containing organic compounds. The organic compounds provide an effective medium for adhering the brazing powder to a metallic surface and enable the preparation of a convenient, easy to use, brazing slurry.

3,589,953

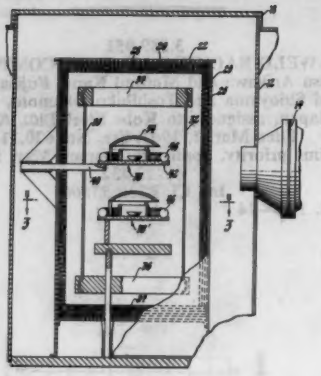
VAPOR DIFFUSION SYSTEM FOR SEMICONDUCTORS

Dillon R. Traxler, Sharpsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 14, 1968, Ser. No. 705,509
Int. Cl. C23c *13/04, 13/12*
U.S. Cl. 148—189 11 Claims

An improved system for vapor diffusing a conductivity-type determining impurity into a plurality of semiconduc-

tor bodies simultaneously. The semiconductor bodies and a source of impurity are placed within a closed but unsealed heat insulated enclosure within a vacuum chamber. Heat is generated and maintained within the enclosure to establish an atmosphere of impurity vapor therewithin to effect diffusion.



3,589,954

NOVEL EPOXY CURED POLYMER BINDERS AND PROPELLANT COMPOSITIONS PREPARED THEREWITH

Harold E. Filter, Midland, and Don L. Stevens, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 21, 1968, Ser. No. 738,830
Int. Cl. C06d 5/06
U.S. Cl. 149—19 6 Claims

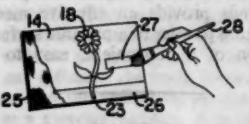
The present invention relates to novel elastomeric cross-linked polymers, i.e., gumstocks, prepared from reactively modified polymers cured with epoxidized diphenyl ethers and solid propellant compositions employing said gumstocks as a binder-fuel.

3,589,955

OIL PAINTING SIMULATION AND THE LIKE

Fletcher G. Edwards, Denver, Colo.
(General Delivery, Newfoundland, Pa. 18445)

Filed Jan. 17, 1969, Ser. No. 792,069
Int. Cl. B44c 1/16, 1/20
U.S. Cl. 156—59 12 Claims



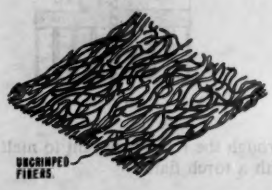
Simulated paintings are made by printing monochrome or polychrome pictures directly onto the surface of a soft, pliable acrylic polymer film which is then embedded into the meshes of a canvas backing, or other textured base. Optional addition of acrylic coating enhances simulation of paint texture. Printing may be by any process, including type, lithography, photography and dye-transfer.

3,589,956

PROCESS FOR MAKING A THERMALLY SELF-BONDED LOW DENSITY NONWOVEN PRODUCT

William Kranz, Newark, Del., and William Lester Stump, Kinston, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 583,001, Sept. 29, 1966. This application Sept. 22, 1967, Ser. No. 675,271
Int. Cl. D04h 1/04
U.S. Cl. 156—62.4 11 Claims



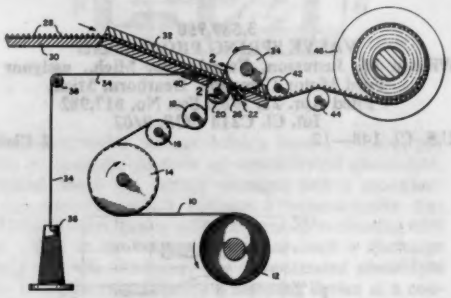
A low density fibrous nonwoven product is made by (a) spinning bicomponent fibers, (b) cutting, crimping, and annealing the fibers, (c) forming the fibers into a low density nonwoven assembly, (d) heating the assembly to bond the fibers, and (e) cooling. Cutting, crimping, and annealing may be carried out in various orders, depending upon the nature of the bicomponent fiber. Annealing is necessary to remove most of the latent crimping and prevent compaction and densification of the assembly during step (d).

3,589,957

METHOD OF APPLYING FASTENER DEVICES TO A TAPE

Maurice Cohn, South St., South Coventry, Conn.

Filed Jan. 23, 1969, Ser. No. 793,454
Int. Cl. A44b 19/42
U.S. Cl. 156—66 2 Claims



A method is disclosed for reinforcing a conventional pressure sensitive paper tape so that the tape can support a plurality of fastening devices, such as garment hooks or eyes, for convenient shipment and storage on reels of the type used on certain fastener applying machines.

3,589,958

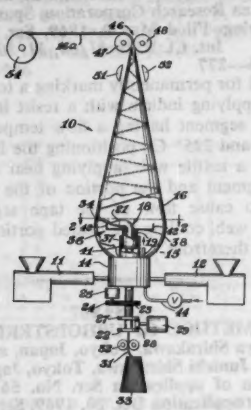
METHOD FOR THE PREPARATION OF FILAMENT REINFORCED SHEET

Walter J. Schrenk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 1, 1969, Ser. No. 820,876
Int. Cl. B29d 7/02
U.S. Cl. 156—74 5 Claims

Filament reinforced plastic sheet of laminar construction is prepared by extruding a tube by the trapped bubble process, centrifugally depositing a filamentary rein-

forcing material on the inner heat plastified surface of the bubble as it is extruded, collapsing the bubble and



sealing opposed surfaces together, thereby entrapping the filamentary reinforcing.

3,589,959

SPLICING OF POLYESTER FILMS

Manfred Sander, Kelkheim, Taunus, and Heinrich Deibig and Michael Schimmel, Frankfurt am Main-Roedelheim, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 26, 1968, Ser. No. 755,056
Claims priority, application Germany, Sept. 7, 1967, A 56,717
Int. Cl. B65h *69/02*
U.S. Cl. 156—157 3 Claims

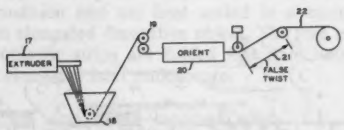
Film having an aromatic polyester support layer has respective ends joined together by first coating an oxime on the polyester support of the respective ends in areas of the support which face in abutment at the joint, so that the oxime acts as a swelling agent and then pressing together two coated facing polyester surfaces at a temperature of between 20° and 200° C.

3,589,960

METHOD OF MAKING NON-TWISTED CORDAGE

Henry A. Hood, Moorestown, and Warren R. Howard, Beverly, N.J., assignors to Wall Industries, Inc., Beverly, N.J.

Filed May 29, 1967, Ser. No. 641,813
Int. Cl. B65h *81/06;* D07b *5/00*
U.S. Cl. 156—161 1 Claim



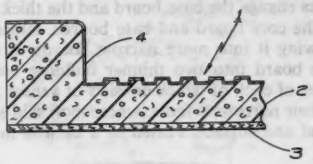
Internally bonded cordage material is produced by joining thermoplastic filaments or thermoplastic ribbon with a plastic binder and then crimping or compressing to round out and form a bundle wherein the binder is distributed along the core of the thus-formed cordage article. Externally bonded cordage is produced by setting up an area of false twist within a bundle of filaments and contacting the exterior of the filament bundle with binder strands of molten plastic applied in an oscillating fashion and then releasing the false twist after setting of the plastic binder.

3,589,961

PROCESS OF FORMING A MATRIX

Reid G. Fordyce, Springfield, Mass., and David D. MacPhail, Thompsonville, Conn., assignors to Monsanto Company

Continuation of application Ser. No. 331,672, Dec. 19, 1963. This application Aug. 2, 1967, Ser. No. 658,007
Int. Cl. B41d *1/00*
U.S. Cl. 156—220 4 Claims



This invention relates to the method of forming and the resultant matrix from which plastic printing plates may be formed. The matrix comprises a foam-metallic layer laminate wherein the metallic face thereof has been compression molded and wherein the foam is capable of receiving and holding a permanent set.

3,589,962

METALLIZATION OF FABRICS

Georges A. Bonjour, Lyon-Bron, France, assignor to La Cellophane, Societe Anonyme, Paris, France

No Drawing. Filed July 1, 1968, Ser. No. 741,294
Claims priority, application France, Aug. 8, 1967, 117,167
Int. Cl. B44c *1/14*
U.S. Cl. 156—233 7 Claims

A method of producing a metallized fabric by a transfer process and such metallized fabric so produced wherein a transfer support is first coated with a substantially non-adherent varnish, a metallic layer is applied over said varnish, and a coating of a thermoplastic adhesive is applied over preselected areas over said metallic layer. After drying, the adhesive coated metallic layer is applied to the surface of the fabric with sufficient heat and pressure so as to bond the metallic layer to the fabric without substantially impregnating the fabric with the thermoplastic adhesive. The finished metallized fabric is produced by stripping away the transfer support.

3,589,963

METHOD FOR PREPARING BUILDING BOARDS HAVING ATTACHED ONTO THEIR BASES VENEER STRIPS STANDING ON THEIR NARROW EDGE AND ATTACHED TO EACH OTHER

Olav Nordgren Jensen, Kotka, Finland, assignor to O. Y. Gutzeitin Laatikkotehdas-A.B. Gutzeits Ladfabrik, Kotka, Finland

No Drawing. Filed Sept. 21, 1967, Ser. No. 669,403
Claims priority, application Finland, Oct. 28, 1966, 2,848/66
Int. Cl. B32b *21/14*
U.S. Cl. 156—264 4 Claims

The subject of this invention is a method for manufacturing building boards in which the surface layer is made of veneer strips standing on their narrow edge and being secured to each other and to the base and in which board the fiber direction of the veneer strips is parallel with the base. The method of manufacture comprises joining together wood veneers manufactured in a conventional manner so that the fiber direction of the veneers will be parallel to the longitudinal axis of the desired final product. The veneers so joined together are, by gluing and pressing, converted into a composite board with the fibers in each layer of the composite board produced lying in

parallel alignment after which the composite board is sawn into staves in one or more steps the width of the staves being about twice the thickness of the surface layer of the final product, the staves are then turned for 90 degrees so that the transverse, horizontal thickness of the single veneer strips in the staves is their smallest dimension, and are assembled together to form a core board. The orientation of the veneers is uniform throughout the core board. A base board is attached to each side of said core board so that the narrowest faces of the veneer strips in the staves engage the base board and the thick board comprising the core board and base boards, either as such or after sawing it into more narrow boards, is cut through the core board into two thinner building boards, a surface layer of each of which consists of veneer strips standing on their narrowest faces, whereupon said surface layer is ground and surface treated in a desired manner.

3,589,964

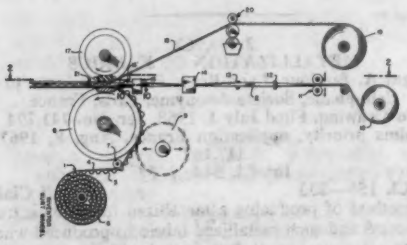
REINFORCED CORRUGATED BOARD MEMBER

Kurt Wandel, R.D. 1, Dowingtown, Pa. 19335

Continuation-in-part of application Ser. No. 475,402, July 28, 1965. This application Apr. 30, 1969, Ser. No. 820,452

Int. Cl. B32b *31/00*

U.S. Cl. 156—268 **12 Claims**



A reinforced corrugated member and the method and apparatus for making same wherein the member includes a corrugated sub-member having a corrugated web and facing web adhered thereto, a plurality of slits in the exposed flutes of the sub-member and a plurality of strips of reinforcing material secured in the slits.

3,589,965

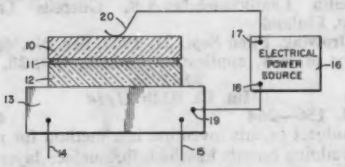
BONDING AN INSULATOR TO AN INSULATOR

George Wallis and Daniel I. Pomerantz, Lexington, John J. Dorsey, Waltham, and Sumner P. Wolsky, Lexington, Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 27, 1968, Ser. No. 779,539

Int. Cl. B29c *27/00, 27/30*

U.S. Cl. 156—272 **8 Claims**



An inorganic electrical insulator material is bonded to another inorganic insulator material by forming a metallic film on a surface of one of the materials, placing the metallized film surface in close contact with the other material and applying an electrical potential across the materials producing a low current through the composite, the insulator materials being heated to increase their electrical conductivity.

3,589,966

TEXTILE WEB IDENTIFICATION

Donald W. Gardner, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

No Drawing. Filed May 9, 1969, Ser. No. 823,517

Int. Cl. B32b *31/04, 31/20*

U.S. Cl. 156—277 **10 Claims**

A method for permanently marking a textile web which comprises applying indicia with a resist ink to a thermoplastic tape segment having a flow temperature between about 100° and 225° C., positioning the ink marked tape segment on a textile web, applying heat and pressure to the tape segment and the portion of the web in contact therewith to cause flow of the tape segment with respect to the web, cooling the heated portion and releasing the pressure therefrom.

3,589,967

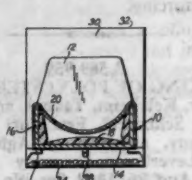
METHOD OF UPHOLSTERING

Katsuya Shirakawa, Tokyo, Japan, assignor to Junichi Shirakawa, Tokyo, Japan

Continuation of application Ser. No. 567,097, July 22, 1966. This application Oct. 20, 1969, Ser. No. 867,855

Int. Cl. B29c *17/00*

U.S. Cl. 156—287 **8 Claims**



A method of upholstering a chair of almost any shape without seaming work by employing a lining material which is airtight and fits the textiles of upholstery materials. The lining material also expands and contracts with the surface of the upholstery material during the process of pneumatically contouring the upholstery to the design conformation and fixing the upholstery in this condition.

3,589,968

LABELLING MACHINE

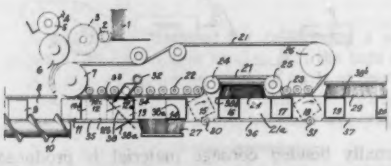
Romuald René Della Vite, Nogent-sur-Marne, France, assignor to Societe Francaise d'Etiquetage Virey & Garnier, Nogent-sur-Marne, Val de Marne, France

Filed Feb. 13, 1968, Ser. No. 705,108

Claims priority, application France, Feb. 15, 1967, 95,008

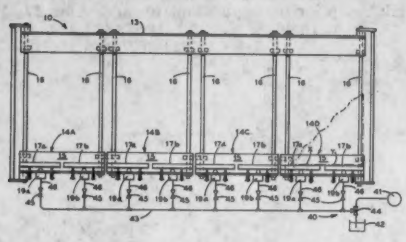
Int. Cl. B65c *9/04*

U.S. Cl. 156—455 **20 Claims**



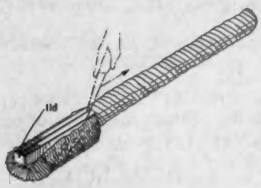
A machine for labelling bottles or containers comprises a label feeding unit for feeding labels to a labelling channel of the machine and a container feeding unit for feeding containers to the channel, the containers being turned during their movement along the channel so that they can be applied to the containers and wrapped fully around the latter during movement of the containers along the channel.

3,589,969
CLAMPING APPARATUS
Bela A. Szilagyi, Flushing, N.Y., assignor to Belmotronics, Inc., Long Island City, N.Y.
Filed Jan. 23, 1969, Ser. No. 793,332
Int. Cl. B25b *11/00*
U.S. Cl. 156—556 7 Claims



A clamping apparatus for use in laminating a strip of material to the edge of a panel, and having fluid powered platens that are self-aligning with the panel edge and operable to press the strip thereagainst. The platens are moveable in a sequentially staggered order to effect uniform spreading of adhesive compressed between the strip and panel edge.

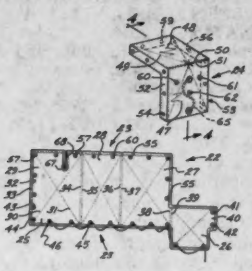
3,589,970
DECORATIVE PLASTIC ARTICLES
Uhel D. Polly, Margate, Fla., assignor to Consolidated Productions Incorporated, Fort Lauderdale, Fla.
Continuation-in-part of application Ser. No. 439,733, Mar. 15, 1965. This application June 27, 1969, Ser. No. 837,010
Int. Cl. D04d *1/02*; A47g *33/06*
U.S. Cl. 161—7 6 Claims



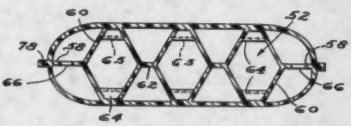
A decorative plastic article having an elongated core. The core consists of the central portion of a plurality of overlaying thermoplastic strips which are in an overlapping condition and are heat sealed in a manner to produce an elongated decorative object. The free ends of the thermoplastic strips are folded and flare outwardly from said elongated heat sealed core.

3,589,971
INSULATING JACKETS FOR INSTRUMENTS COMPRISING A LAYER OF ASBESTOS CLOTH, A LAYER OF COTTON DRILL FABRIC, A LAYER OF GLASS FIBER INSULATION AND A LAYER OF NEOPRENE COATED ALUMINIZED NYLON
Sheridan J. Reed, 305 Cool Spring Drive, Rte. 3, Camden, S.C. 29020
Filed Aug. 4, 1967, Ser. No. 658,498
Int. Cl. B32b *3/06*
U.S. Cl. 161—48 1 Claim

The insulating jackets prevent freezing and rapid temperature fluctuations of instruments and control equipment, and are particularly useful to insulate such devices in chemical process equipment. The jackets are formed from a multilayer material which is weatherproof, is resistant to heat damage, and has excellent thermal insulating properties. Releasable fasteners facilitate rapid installation of the jackets, and allow removal of the jackets when the instruments require servicing.

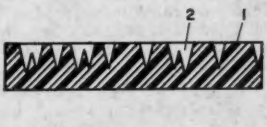


3,589,972
HOLLOW STRUCTURE
James W. Greig, Grosse Pointe Park, and David P. Anderson, Lathrup Village, Mich., assignors to Woodall Industries Inc., Detroit, Mich.
Continuation-in-part of application Ser. No. 512,639, Dec. 9, 1965, now Patent No. 3,462,330. This application June 16, 1969, Ser. No. 833,544
Int. Cl. B32b *3/12*
U.S. Cl. 161—68 4 Claims



A hollow structure having an integral hollow plastic skin enclosing a core member. The plastic skin has an integral peripheral flange free of mechanical stresses, and the core member has a peripheral edge received within the flange of the skin. The core member in one embodiment is plastic, forming an integral flange, and portions of the core are displaced and fused to the skin between the flanges.

3,589,973
SUEDE TYPE PRODUCT
Emanuel Mittman, Forest Hills, N.Y., assignor to W. R. Grace & Co., New York, N.Y.
Filed Oct. 31, 1966, Ser. No. 590,868
Int. Cl. B32b *3/00*
U.S. Cl. 161—116 2 Claims



A synthetic polymeric sheet is disclosed having a suede-like appearance formed by cone-like surface indentions.

3,589,974

DECORATIVE LAMINATE SURFACED WITH A COMPRESSED LAYER OF A FIBRILLATED ACRYLIC FIBER PAPER, SAID PAPER HAVING BEEN TRANSPARENTIZED DURING A HEAT AND PRESSURE CONSOLIDATION STEP AND HAVING BEEN SUBSTANTIALLY FREE OF ANY IMPREGNATING RESIN

Donald Joseph Albrinck, Reading, and Alfred Thomas Guertin, Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

No Drawing. Filed Apr. 24, 1968, Ser. No. 723,924
Int. Cl. B32b 5/25, 27/08
U.S. Cl. 161—150 10 Claims

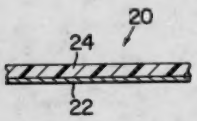
A heat and pressure consolidated laminate comprising a rigidity imparting base member, a decorative sheet impregnated with melamine-formaldehyde resin and with certain soft thermoplastic acrylic copolymers having a glass transition temperature of less than about 25° C., having bonded thereto a compressed layer of a fibrillated acrylic fiber paper, said paper having been transparentized during the heat and pressure consolidation step and having been substantially free of any impregnating resin and said paper having a basis weight of at least 20 lbs.

3,589,975

COMPOSITE SHEET OF PLASTIC AND METALLIC MATERIAL AND METHOD OF MAKING THE SAME

William Page Andrews, Richmond, and Yale M. Brandt, Waynesboro, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Mar. 23, 1967, Ser. No. 625,508
Int. Cl. B32b 33/00
U.S. Cl. 161—165 10 Claims



This disclosure relates to an improved composite sheet means comprised of webs of plastic and metallic material laminated together to provide an economical composite sheet means having a thickness which is substantially smaller than the combined thickness of the individual webs prior to lamination thereof, such composite sheet means having exceptionally high strength. Further, this disclosure also relates to a method of making such composite sheet means without requiring separate adhesive means to hold together the webs comprising such composite sheet means.

3,589,976

COMPOSITE FILMS OF POLYOLEFINS AND POLYSTYRENE

Louis F. Erb, Nixon, N.J., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Mar. 24, 1967, Ser. No. 625,629
Int. Cl. B29c 27/00; B32b 27/08
U.S. Cl. 161—165 3 Claims

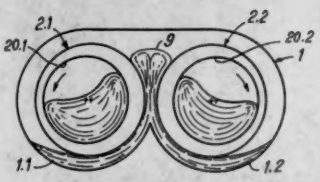
Composite film of coextruded polystyrene and polyolefins exhibit a favorable balance of the stiffness of polystyrene and other tensile properties of polyolefins. Surprisingly, little effect on low temperature impact strength is noted, surface properties are improved as compared to those of polyolefins alone.

3,589,977

METHOD OF AND APPARATUS FOR IMPARTING COMBINED ROTATIONAL, PULSATORY, AND CIRCULATORY MOVEMENTS TO A SUSPENSION OF FIBERS

Jean Fournet, Saint-Romain-en-Gal, France, assignor to Societe d'Exploitation des Brevets Granofibre-Sebreg, Paris, France

Filed Apr. 26, 1968, Ser. No. 724,427
Claims priority, application France, Apr. 27, 1967, 104,408; Nov. 13, 1967, 127,919
Int. Cl. D21c 9/00
U.S. Cl. 162—9 25 Claims



A method of producing generally spherical fibrous aggregates from a suspension of fibres in a liquid, in which the fibres are caused to rotate about themselves and in circulation to engender speed gradients therein, and in addition pulsatory movement is applied to the suspension to engender an ebb and flow therein. The apparatus includes an outer container with at least one rotor located therewithin and mounted for eccentric rotation to produce the ebb and flow therein.

3,589,978

PROCESS OF MAKING WATER REPELLENT PAPER USING A FATTY POLYISOCYANATE AND A CATIONIC GUM ETHER AND PRODUCT THEREFROM

Marwan R. Kamal, Dhahran, Saudi Arabia, and James L. Keen, New Brighton, Minn., assignors to General Mills, Inc.

No Drawing. Filed Sept. 29, 1967, Ser. No. 671,567
Int. Cl. D21d 3/00
U.S. Cl. 162—158 8 Claims

In a process of making water repellent paper, including the addition to the aqueous dispersion of cellulosic fibers of (1) an organic polyisocyanate of the formula

$$R—[(CH_2)_yNCO]_x$$

where y is 0 or 1, x is an integer of 2 to about 4 and R is the hydrocarbon group of polymerized fat acids derived from fat acids of 16 to 22 carbon atoms such as dimeryl isocyanate and (2) a quaternary ammonium polygalactomannan gum ether cationic retention agent, for example quaternary ammonium gum ether.

3,589,979

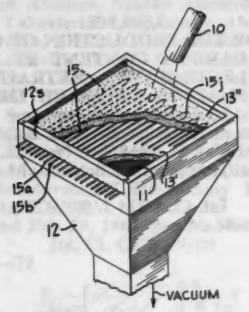
INSULATED HEAT SENSING ASSEMBLIES AND METHOD OF MAKING THE SAME

Donald I. Finch, North Woods, Glenside, and John R. Wiese, Dresher, Pa., assignors to Leeds & Northrup Company, Philadelphia, Pa.

Filed Aug. 10, 1967, Ser. No. 659,702
Int. Cl. B29j 5/00
U.S. Cl. 162—219 8 Claims

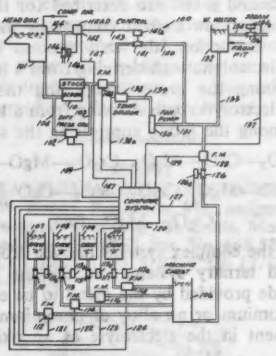
Fiber-insulated heat sensing assemblies such as insulated thermocouple assemblies and method of mass-producing the same using a liquid slurry containing fibers. A plurality of heat sensing devices, such as thermocouples, are positioned between layers of a slurry containing water, a binding agent, and fibers which may be of refractory material so that the electrical leads thereof desirably extend beyond the layers. The liquid is withdrawn from

the layers of slurry to cause the fibers thereof to be intertwined with each other to form a composite blanket of densified fibers compacted around and between the leads and around the junction of each thermocouple.



The composite blanket of fibers thus formed with thermocouple assemblies embedded therein is then severed into sections which result in individual felt insulated thermocouple assemblies.

3,589,980
CONTROL OF HEADBOX STOCK CHARACTERISTICS
Salomon M. Salomon, Madison, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Jan. 2, 1968, Ser. No. 694,997
Int. Cl. D21f *1/08*
U.S. Cl. 162—258 **2 Claims**



This invention is directed to apparatus for controlling the characteristics of stock delivered to a headbox of a papermaking machine. The stock of different consistencies are contained in a plurality of stock reservoirs and the stock from each of the reservoirs is delivered to a main stock chamber where the stock is mixed together to form a stock of a desired consistency. The stock from the main stock chamber is then delivered via a flow control valve to a stock screening apparatus where the stock is finally screened before being delivered to a headbox of a papermaking machine. The temperature of the stock is measured prior to the stock entering the screening apparatus, and the pressure drop of the stock passing through the apparatus is measured. The measured pressure drop and temperature of the stock is then computed to develop control signals to control the flow of stock to the screening apparatus thereby maintaining the stock delivered to the headbox at a desired characteristic.

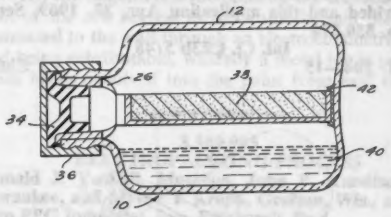
3,589,981
METHOD OF MAKING 3B-HYDROXY-$\Delta^{5(10)}$-STEROIDS
Hans-Detlef Berndt, Wolfgang Koch, Klaus Kieslich, Rudolf Wiechert, and Hans-Joachim Koch, Berlin, Germany, assignors to Schering AG, Berlin, Germany
No Drawing. Filed July 8, 1968, Ser. No. 743,256
Claims priority, application Germany, July 7, 1967, Sch 40,978; Nov. 1, 1967, P 16 43 051.6
Int. Cl. C07c *167/00*
U.S. Cl. 195—51 **9 Claims**

3β-hydroxy-$\Delta^{5(10)}$-steroids of the pregnane and androstane series are produced by microbiological reduction of 3-keto-$\Delta^{5(10)}$-steroids of the pregnane or androstane series with microorganisms or enzymes isolated therefrom.

3,589,982
PRODUCTION OF L-ASPARAGINASE
Robert E. Peterson and Alex Ciegler, Peoria, Ill., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed May 1, 1969, Ser. No. 821,107
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 **6 Claims**

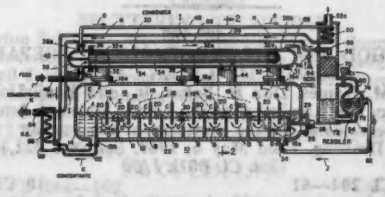
L-asparaginase is produced in high yield by culturing certain fungi, namely, *Erwinia aroideae* or *Hydrogenomonas eutropha.*

3,589,983
CULTURE BOTTLE ASSEMBLY
William J. Holderith, Wyckoff, and John J. Lawless, Jr., Brookside, N.J., assignors to Becton Dickinson and Company
Filed Dec. 11, 1968, Ser. No. 782,889
Int. Cl. C12k *1/10*
U.S. Cl. 195—139 **7 Claims**



A culture bottle assembly of the type used for culturing blood samples. The assembly includes a tray insert which is designed to hold a solid agar nutrient material at a location along the axial centerline of the bottle. The bottle also houses a liquid nutrient broth which may be separated from the solid agar by positioning the bottle on its side.

3,589,984
APPARATUS FOR DEHYDRATING ORGANIC LIQUIDS
Laurance S. Reid, 601 Broad Lane, Norman, Okla. 73069
Filed Nov. 21, 1968, Ser. No. 777,840
Int. Cl. B01d *3/00, 3/02*
U.S. Cl. 202—173 **5 Claims**



Apparatus for dehydrating a liquid mixture of organic liquid and water comprising a closed vessel having a lower

liquid space for holding a quantity of the liquid mixture and an upper vapor space for holding a volume of vapor of the mixture in direct contact with the surface of the liquid to form a liquid-vapor interface. Means in communication with the vapor space is provided for reducing the partial pressure of the water-vapor therein below an equilibrium pressure across said interface whereby additional water in the liquid mixture is vaporized to pass into the vapor space, and means is provided for collecting and removing water from said vessel.

3,589,985

ELECTROLYTIC RECORDING PROCESS AND MATERIALS

Eugene F. Barnes, Arlington Heights, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

No Drawing. Filed July 3, 1969, Ser. No. 848,378
Int. Cl. B21h *1/20*
U.S. Cl. 204—2 22 Claims

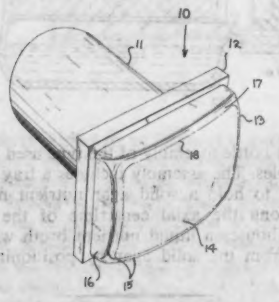
Electrolytic facsimile recording is conducted employing a recording medium including a support such as paper impregnated with an electrolytically conducting solution containing a formaldehyde sulfoxylate reducing agent for depositing dissolved electrochemically oxidized anodic metal on the medium as a marking substance, the said solution also containing lithium hydroxide and preferably an alkali metal stannate, an alkaline buffer, and an alkali metal nitrate.

3,589,986

METHOD OF FABRICATING A GLASS FORMING APPARATUS

Carroll Thomas Null, Columbus, Ohio, assignor to Owens-Illinois, Inc.

Original application July 13, 1966, Ser. No. 564,879. Divided and this application Apr. 28, 1969, Ser. No. 850,274
Int. Cl. C23b *5/48*
U.S. Cl. 204—15 3 Claims



Method of fabricating a plunger for the manufacture of pressed glass articles wherein the cleaned and roughened surface of the plunger is plated with chromium in such a manner that the chromium is deposited only on the edge and peripheral border area and the plated surface is then treated with an abrasive to produce a stippled effect thereon.

3,589,987

METHOD FOR THE ELECTROLYTIC PREPARATION OF TUNGSTEN CARBIDE

John M. Gomes, Don H. Baker, Jr., and Kenji Uchida, Reno, Nev., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed May 6, 1969, Ser. No. 822,323
Int. Cl. B01k *1/00*
U.S. Cl. 204—61 10 Claims

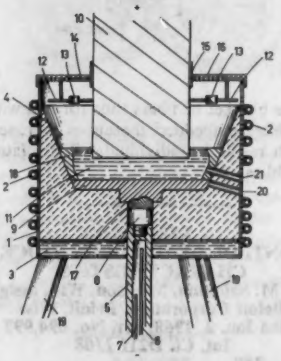
Tungsten monocarbide is synthesized by electrolysis from a molten bath of alkali metal tungstate, alkali metal halide, alkali hydroxide and a compound of boron in the form of B_2O_3, alkali metaborate ($M_2B_2O_4$) or alkali tetraborate ($M_2B_4O_7$). The cell anode is the carbon source.

3,589,988

PROCESS FOR THE PRODUCTION OF CHROMIUM OF LOW CARBON CONTENT BY MEANS OF FUSED ELECTROLYTIC EXTRACTION AND CHROMIUM ALLOY OBTAINED THEREBY

Rene Winand, Ixelles, Belgium, assignor to Universite Libre de Bruxelles, Brussels, Belgium

Filed May 13, 1968, Ser. No. 728,594
Claims priority, application Belgium, May 19, 1967, 698,705
Int. Cl. C22d *3/00, 3/20*
U.S. Cl. 204—64 10 Claims



A process and a cell are described for the production of chromium of low carbon content by means of fused electrolytic extraction, the said process including the use of an electrolytic bath deriving from a ternary system selected among the group comprising the systems the use of an electrolytic bath deriving from a ternary system selected among the group comprising the systems

Cr_2O_3—CaO—Al_2O_3, Cr_2O_3—MgO—Al_2O_3

Cr_2O_3—CaO—MgO, Cr_2O_3—SiO_2—CaO and

Cr_2O_3—MgO—SiO

as well as the complex systems derived from compounds of the said ternary system, and the use of preference of a cathode provided by the metal to be extracted, such as the chromium or an alloy of chromium with another metal present in the electrolyte as an oxide.

3,589,989

ELECTROLYTIC CELL START-UP PROCEDURE

George Gerald Day, New York, N.Y., assignor to F. Barry Haskett, New York, N.Y., and John Hixon Martin, Washington, D.C., fractional part interest to each

No Drawing. Filed Oct. 23, 1968, Ser. No. 770,095
Int. Cl. C22d *3/00, 3/16*
U.S. Cl. 204—64 6 Claims

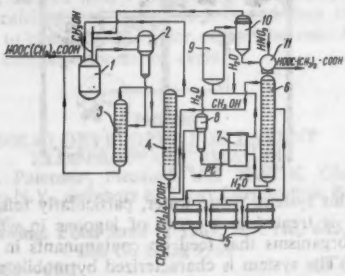
A start-up procedure for an electrolytic cell using a molten metal cathode is provided wherein a salt of the cathode metal is mixed with the normal electrolyte to yield a mixture with a melting point lower than that of the pure normal electrolyte, the cell operation commencing by heating to a temperature of the melting point of the pure normal electrolyte using alternating current with subsequent utilization of direct current and decomposition of the cathode metal salt to cathode metal and the corresponding anion leaving the pure normal electrolyte for normal operation of the cell.

3,589,990

PROCESS FOR THE PRODUCTION OF SEBACIC ACID

Gilya Naumovich Freidlin, Tula, Jury Mikhailovich Tjurin, Gorky, Evgeny Pavlovich Kovsman, Tula, Ary Artemievich Adamov, Nikolai Alexandrovich Kochergin, Izrail Yakovievich Lubyanitsky, Alexandr Semenovich Nalivaiko, Svetlana Mikhailovna Posternak, and Maxim Leibovich Ferd, Severodonetsk Luganskoi oblast, Olga Tikhonovna Kofanova, Tula, Sergei Mikhailovich Shtefan, Alexei Danilovich Kovalev, Margarita Sergeevna Timagina, and Alexandr Stepanovich Buerakov, Severodonetsk Luganskoi oblast, and Mikhail Yakovlevich Fioshin and Ljudmila Ivanovna Kazakova, Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Monomerov, Tula, U.S.S.R.

Filed Feb. 29, 1968, Ser. No. 709,346
Int. Cl. C07b *29/06*
U.S. Cl. 204—72 14 Claims



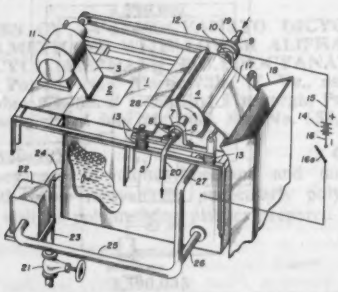
A process for the production of sebacic acid in which monomethyl adipate is electrolytically condensed to dimethyl sebacate in a methanolic medium in the presence of an alkali metal monomethyl adipate, after which the obtained mixture is stripped of methanol and allowed to stand to form an ester layer containing dimethyl sebacate and a layer containing alkali metal monomethyl adipate. The ester layer is removed and subjected to a first hydrolysis with water and subsequently to a second hydrolysis in an aqueous solution of a mineral acid, after which the formed sebacic acid is recovered.

3,589,991

TITANIUM DIOXIDE RECOVERY

Irvin W. Hardy, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 18, 1967, Ser. No. 668,523
Int. Cl. B01k *5/00, 5/02;* C23b *13/00*
U.S. Cl. 204—180R 2 Claims



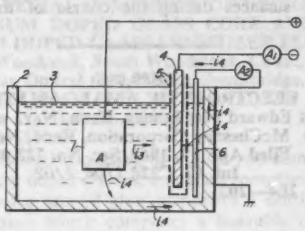
Titanium dioxide is recovered from an aqueous titanium dioxide slurry by applying an electric field between two electrodes immersed in the slurry thereby causing migration of suspended titanium dioxide particles to one of the electrodes and deposition of these particles onto that electrode in the form of a coating which is subsequently recovered.

3,589,992

METHOD OF ELECTRODEPOSITION OF WATER-THINNABLE PAINTS

Hitoshi Kawai, Neyagawa-shi, Makoto Mikawa, Suita-shi, Yoshiaki Oyabu, Kyoto, and Yoshitaka Atarashiya and Masanori Matsumoto, Aki-gun, Hiroshima-ken, Japan, assignors to Nippon Paint Co., Ltd., Osaka, and Toyo Kogyo Company Limited, Aki-gun, Hiroshima-ken, Japan

Filed Sept. 3, 1968, Ser. No. 757,007
Claims priority, application Japan, Sept. 4, 1967, 42/56,448
Int. Cl. B01k *5/00*
U.S. Cl. 204—181 4 Claims



A process for the electrodeposition coating which comprises immersing an article to be coated (which is an anode) and a cathode surrounded by diaphragms in an electroconductive electrodeposition cell containing a water-thinnable paint, and passing an electric current between said article and the cathode to form a coating on the article. An electroconductive metal plate is inserted between the diaphragms surrounding the cathode and the wall of the cell nearest to this cathode, said plate being connected to the wall through an electroconductive means and being substitutable, whereby a metal ion is prevented from being dissolved into the paint from said cell wall.

3,589,993

ELECTROPAINTING PROCESS

Donald J. Voskuil, Muskego, John P. Knudtson, Milwaukee, and Myron J. Krupp, Grafton, Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Nov. 14, 1968, Ser. No. 775,954
Int. Cl. B01k *5/02;* C23b *13/00*
U.S. Cl. 204—181 10 Claims

When a mixture of dissimilar pigments are employed in an aqueous composition, for example, an electrodeposition bath, pigment separation is frequently noted. It has now been found that by preparing two aqueous pigment portions such as (A) a pigment, an anion-active agent, and a soluble silicate; and (B) a pigment, a cation-active agent, and a soluble metal salt capable of forming an insoluble silicate and then mixing (A) and (B), thereafter forming a conventional pigment, this problem is reduced or eliminated. The pigments prepared in this manner may be used as pigments in electrodepositable compositions.

3,589,994

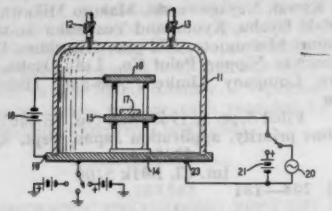
SPUTTERING TECHNIQUE

Newton Schwartz, Morris Township, Morris County, and Frederick Vratny, Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Continuation-in-part of abandoned application Ser. No. 372,537, June 4, 1964. This application Jan. 31, 1968, Ser. No. 701,964
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 7 Claims

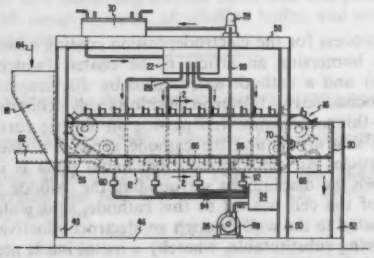
The electrical and physical properties of cathodically sputtered films may be controlled by utilizing either elec-

tron or negative ion bombardment or alternatively, electron or negative ion, and positive ion bombardment of



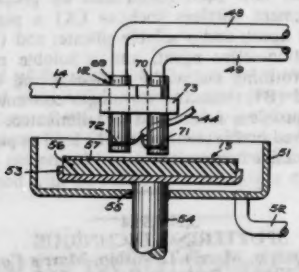
substrate surfaces during the course of the sputtering process.

3,589,995
ELECTROLYTIC AMALGAMATOR
Robert Edward McChesney, Reno, Nev., assignor to McChesney Corporation, Reno, Nev.
Filed Apr. 17, 1968, Ser. No. 722,023
Int. Cl. C22d *1/04, 1/02*
U.S. Cl. 204—202 **2 Claims**



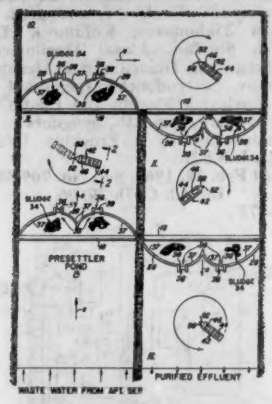
Electrolytic amalgamation including positively driven multiple pulp treatment cells cooperating with a plurality of separate mercury bed cathodes with the mercury being constantly recirculated and reactivated.

3,589,996
OPTICAL SURFACE GENERATING APPARATUS
David Chu, Cambridge, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed Apr. 15, 1968, Ser. No. 721,470
Int. Cl. B23p *1/12*
U.S. Cl. 204—224 **5 Claims**



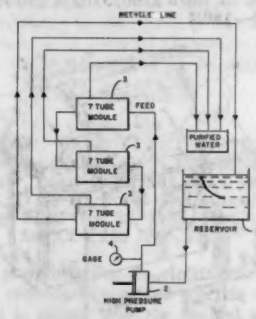
A surface generating system wherein continuous streams of electrolyte are circulated over platinum anode and cathode electrodes and onto the work surface of an optical blank. During movement over the work surface, the electrodes are selectively energized to produce electropolishing thereof without adverse effects of reaction plating or other factors that degrade surface quality.

3,589,997
METHOD FOR PURIFYING WASTE WATER
James F. Grutsch, Hammond, and Russell C. Mallatt, Crown Point, Ind., assignors to Standard Oil Company, Chicago, Ill.
Filed May 15, 1969, Ser. No. 824,858
Int. Cl. C02c *5/10*
U.S. Cl. 210—13 **2 Claims**



In this system, waste water, particularly refinery waste water, is treated in a series of lagoons in which thrive microorganisms that feed on contaminants in the waste water. The system is characterized by mobile aerator apparatus moving across the lagoons' surfaces. These apparatus introduce air into the lagoons and churn surface water, and they have means which direct at least some of the churning surface water towards the lagoons' bottoms. The underwater turbulence scours the lagoons' bottoms and provides a way of controlling sludge deposits.

3,589,998
PROCESS FOR INHIBITING SCALE FORMATION ON THE SURFACE OF MEMBRANES IN REVERSE OSMOSIS APPARATUSES
Herbert L. Rice, Fort Worth, and Arthur Cizek and Marvin O. Thaemar, Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.
Continuation-in-part of application Ser. No. 851,085, Aug. 18, 1969. This application May 8, 1970, Ser. No. 35,816
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **12 Claims**



This invention relates to a process for inhibiting scale formation on the surface of membranes in reverse osmosis apparatuses. The process utilizes as an additive to the water prior to its passage through the apparatus an acrylic composition formed from about 80 to 90 parts by weight acrylic acid, about 7 to 15 parts by weight thioglycolic acid, and about 1.5 to 5 parts by weight ammonium persulfate.

3,589,999

DEIONIZATION PROCESS

Wayne A. McRae, Lexington, and William E. Katz, Weston, Mass., assignors to Ionics, Incorporated, Watertown, Mass.

No Drawing. Filed Oct. 25, 1968, Ser. No. 770,795
Int. Cl. B01d *15/04*
U.S. Cl. 210—28 12 Claims

The invention is directed to the deionization of water by employing cation exchange resins in the alkaline earth form such as calcium and anion exchange resins in the carbonate form. The calcium and carbonate ions released from the resin during the deionization process precipitates out as insoluble calcium carbonate to give an effluent from the resin exchanger of potable water. Regeneration of the resins back to their initial ionic form may be accomplished in a mixed bed without the necessity of separating the resins. Regeneration is performed by contacting the bed with a lime slurry, rinsing free of unabsorbed calcium and hydroxide ions and then treating with CO_2 to carbonate the anion resin. The resin is then ready for another deionization cycle.

3,590,000

SOLID DEVELOPER FOR LATENT ELECTROSTATIC IMAGES

Frank M. Palermiti, Pittsford, and Arun K. Chatterji, Webster, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

No Drawing. Filed June 5, 1967, Ser. No. 643,377
Int. Cl. G03g *9/02*
U.S. Cl. 252—62.1 18 Claims

A finely-divided, rapid melting toner comprising a colorant, a solid, stable hydrophobic metal salt of a fatty acid, and a polymeric esterification product of a dicarboxylic acid and a diol comprising a diphenol.

3,590,001

PHOSPHATE FREE HEAVY DUTY DETERGENT FORMULATIONS

Robert C. Taylor, King of Prussia, and Betty J. Wolsky, Fort Washington, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,498
Int. Cl. C11d *3/066*
U.S. Cl. 252—137 3 Claims

Heavy duty built synthetic detergent compositions wherein the surfactant is either a lower alkanol amine or N-methyl taurine salt of a linear alkylbenzene sulfonic acid and the builders are free of phosphates.

3,590,002

MIXTURES OF 2,4'-DIISOCYANATO DICYCLOHEXYLMETHANE WITH LOWER ALIPHATIC AND CYCLOALIPHATIC POLYISOCYANATES

Eugene L. Powers, New Martinsville, W. Va., assignor to Mobay Chemical Company, Pittsburgh, Pa.

No Drawing. Filed July 21, 1967, Ser. No. 654,982
Int. Cl. C07c *119/04*
U.S. Cl. 252—182 3 Claims

2,4'-diisocyanato dicyclohexylmethane and mixtures thereof with other isocyanates, particularly polyisocyanates, as well as polyurethane plastics prepared therefrom.

3,590,003

INFRARED CHEMILUMINESCENT COMPOSITION

Robert A. Meyers, Encino, and Christopher S. Foote, Los Angeles, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed June 28, 1967, Ser. No. 649,484
Int. Cl. C09k *3/00*
U.S. Cl. 252—186 3 Claims

This invention relates to a chemiluminescent composition which produces light in the infrared region of the spectrum comprising a halogenating agent, an organic compound such as dimethyldibenzanthrone, 4-cyclohexylbenzanthrone, pyranthrone, 2-keto-3-methyl-1,3-diazbenzanthrone, dibenzanthrone, diethyldibenzanthrone, diphenyldibenzanthrone, chlorophyll, 3-methyl - 1,3 - diaza-1,9-benzanthrone, 3 - bromobenz(d,e)anthrone and violanthrone, an oxidizing agent and a polar solvent. Light produced by the chemiluminescent composition, is invisible to the naked eye but may be detected by the state-of-the-art photo multiplier devices.

3,590,004

LASER MATERIAL COMPRISED OF ERBIUM AND YTTERBIUM DOPED GLASS CORE AND NEODYMIUM DOPED GLASS SENSITIZER ELEMENT

Richard F. Woodcock, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 8, 1968, Ser. No. 751,120
Int. Cl. C09k *1/04*
U.S. Cl. 252—301.4 6 Claims

A laser material consisting of a glass rod composed of two differently doped glasses, one glass comprises a laserable core and a second glass comprises a sensitizer element. The glass which comprises a laserable core contains erbium as the laserable ion and also includes ytterbium oxide as a sensitizer. The glass which comprises the sensitizer element contains neodymium oxide and ytterbium oxide which act solely as sensitizer ions. When the glass rod is pumped with optical energy, a large amount of energy is absorbed by the neodymium and ytterbium ions in the sensitizer element, which energy is transmitted into the laserable core by both radiative and non-radiative processes to assist in producing a state of population inversion in the erbium ions present within the core.

3,590,005

EMULSIFIER COMPOSITIONS AND EMULSIONS CONTAINING THE SAME

John T. Foley, Verona, and Bernard R. Bluestein, Glen Rock, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

No Drawing. Filed Mar. 6, 1968, Ser. No. 710,763
Int. Cl. B01j *13/00*
U.S. Cl. 252—308 19 Claims

Emulsifier compositions comprising admixtures of (a) between about 10% and 90% by weight of an oxidized hydrocarbon wax-amine condensation product and (b) between about 90% and 10% of a metal salt of an oxidized hydrocarbon wax, said emulsifier compositions being particularly effective for preparing water-in-oil emulsions that are stable in the presence of electrolytes and at temperatures as high as about 260° C.

3,590,006

AEROSOL COMPOSITIONS USEFUL IN PREPARATION OF THIN-LAYER CHROMATOGRAPHY PLATES

Walter Page, Convent Station, and William Russell Schevey, Mount Freedom, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 589,850, Oct. 27, 1966. This application Sept. 13, 1967, Ser. No. 667,381
Int. Cl. C09k *3/30, 3/00;* B01d *15/08*
U.S. Cl. 252—408 9 Claims

This application relates to a method for preparation of thin-layer chromatography plates by spraying backing plates with certain aerosol compositions, and to the aerosol compositions, which comprise a powdered adsorbent,

a binder, a dispersion means and a propellant. The following is an example of a preferred composition:

	G.
Powdered silica gel	15.0
Elvamide 8063 polyamide resin	2.6
Ethanol	36.4
Methylene chloride	26.0
Monochlorodifluoromethane	20.0
	100.0

The compositions are particularly useful in that they contain a binder which binds the composition firmly to the backing plate.

3,590,007

PROCESS FOR REGENERATION OF SPENT HYDROCONVERSION CATALYST

Hans U. Schutt, Lafayette, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 725,194, Apr. 29, 1968. This application Mar. 12, 1969, Ser. No. 806,704

The portion of the term of the patent subsequent to Jan. 26, 1988, has been disclaimed

Int. Cl. B01j *11/02, 11/76*

U.S. Cl. 252—411 **7 Claims**

A process for non-oxidative regeneration of coked hydroconversion catalysts characterized by incorporating a hydrogenation metal compound on a coked catalyst (preferably in situ) and contacting with hydrogen and hydrogen sulfide followed by contacting with hydrogen and elevated temperature.

3,590,008

PROCESS FOR PREPARING LITHIUM HYDROCARBIDE CATALYSTS

Virgil L. Hansley, Cincinnati, Ohio, and Fred K. Morgan, Cold Springs, Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Filed June 5, 1968, Ser. No. 734,519

Int. Cl. C07f *1/02*

U.S. Cl. 252—429 **3 Claims**

A lithium catalyst is provided for polymerization of dienes and unsaturated monomers copolymerizable therewith. Lithium metal is coated on sodium or potassium chloride particles, and then converted to a lithium hydrocarbide catalyst, for production of lithium-terminated polymers, which polymers can then be reacted with compounds reactive with lithium organometallic compounds.

3,590,009

HALOMETHYL VINYL GLYCIDYL ETHERS AND POLYMERS THEREOF

Arthur E. Gurgiolo and Robert W. McAda, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

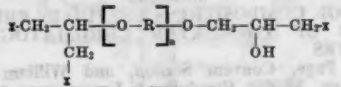
No Drawing. Filed Nov. 1, 1967, Ser. No. 679,624

Int. Cl. C08g *23/02, 23/06*

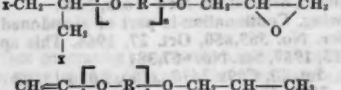
U.S. Cl. 260—2 **8 Claims**

Our invention comprises:

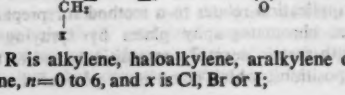
(1) New compounds of the formulas



(I)



(II)



(III)

wherein R is alkylene, haloalkylene, aralkylene or haloaralkylene, n=0 to 6, and x is Cl, Br or I;

(2) Their method of preparation which comprises reacting by contacting a glycerine di-halohydrin with 0 to 6 moles of an alkylene oxide and at least 1 mole of an epihalohydrin to produce Formula I and then treating same with a dehydrohalogenating agent to produce Formulas II and III;

(3) The polymers and copolymers of Formulas II and III;

(4) The method of vulcanizing the polymers and copolymers of Formula III.

3,590,010

METHOD OF PRODUCING HIGH MOLECULAR WEIGHT POLYMERS OF VICINAL EPOXY COMPOUNDS WITH ORGANOMETALLIC HALIDE-ENOLATE CATALYSTS

Kunio Konishi and Masao Nikki, Osaka-fu, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

No Drawing. Filed Mar. 11, 1969, Ser. No. 806,285

Int. Cl. C08g *23/06*

U.S. Cl. 260—2 **3 Claims**

A method of polymerizing alkylene oxides which comprises using as catalyst a reaction product obtained by reacting an alkali metal enolate with a reagent selected from the group consisting of the Grignard reagents and the Blaise reagents, said reaction product being used in an amount in the range of 0.01–10 mol percent based on the monomeric alkylene oxide.

3,590,011

METHOD FOR THE PRODUCTION OF AN ANION-EXCHANGE RESIN

Lev Leonidovich Grachev, Ul. Karla Marka 93, kv. 23; Igor Vasilievich Samborsky, Ul. Krasnoflotskaya 17, kv. 3; and Alexei Feodosievich Chetverikov, Ul. Gazetnaya 70, kv. 30, all of Sverdlovskaya, Oblast Nizhny Tagil, U.S.S.R.

No Drawing. Filed Oct. 16, 1968, Ser. No. 768,198

Int. Cl. C08g *33/06, 23/12*

U.S. Cl. 260—2.1 **16 Claims**

Production of a wide variety of anion exchange resins which have good chemical resistance and thermal stability, high exchange rate and which are insignificantly poisoned with organic materials by condensing epichlorohydrin and ammonia in a molar ratio of from 1:0.25 to 1:0.5 to produce a water soluble oligomer containing chloromethyl groups, adjusting the hydrogen ion concentration of the reaction medium to $\geqslant 7$ with a compound which may be inorganic, aliphatic organic or aromatic organic, taken in an amount of 2 to 0.25 equivalents per mole of the epichlorohydrin feed, preparing a gel, and aging the gel. The characteristics of exchange resin vary depending on the material used to adjust the hydrogen ion concentration.

3,590,012

PROCESS FOR THE PRODUCTION OF CELLULAR POLYURETHANE PLASTIC MOLDING HAVING A COMPACT SURFACE

Gunter Hauptmann, Leverkusen, Germany, Heinz Wolfgang Patzelt, Carnegie, Pa., and Hermann Schafer, Opladen, and Hans Wirtz, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellshaft, Leverkusen, Germany

No Drawing. Filed May 5, 1969, Ser. No. 821,992

Claims priority, application Germany, May 7, 1968, P 17 69 313.9

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 **6 Claims**

Cellular polyurethanes having a compact integral skin are prepared using as the blowing agent mixtures of halogenated hydrocarbons and hydrates of organic compounds that split off the water of hydration at temperatures above 40° C.

3,590,013

SELF-EXTINGUISHING ALKENYL AROMATIC POLYMERS WITH UNIFORM PORE STRUCTURE

Horst Jastrow and Michael Lederer, Frankfurt am Main, and Horst Schnable, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed May 2, 1969, Ser. No. 821,462
Claims priority, application Germany, May 8, 1968, P 17 69 320.8
Int. Cl. C08f *45/60, 47/10, 7/04*
U.S. Cl. 260—2.5 3 Claims

The invention relates to self-extinguishing foamable alkylene aromatic polymers containing a foaming agent, an aliphatic bromine compound and 0.2 to 1% by weight of a N.O-acetidinone peroxyacetal.

3,590,014

FLAME RETARDANT FOAMED AND FOAMABLE POLYMER COMPOSITIONS

Patrick Vivian Burt, Newport, England, assignor to Monsanto Chemicals Limited, London, England

No Drawing. Filed Nov. 21, 1968, Ser. No. 777,894
Claims priority, application Great Britain, Dec. 1, 1967, 54,732/67
Int. Cl. C08f *47/10, 45/58, 29/02*
U.S. Cl. 260—2.5B 10 Claims

Foamable polymers suitable for the production of flame-retardant foamed resins by the prefoam/steam-molding technique comprise particles of a foamable thermoplastic resin coated with a mixture of a pentabromophenyl alkenyl ether and a tribromophenyl alkenyl ether.

3,590,015

NON-FOAMING AMIDE INTERPOLYMER COATING COMPOSITIONS

Erwin J. Kapalko, Delaware, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed May 23, 1968, Ser. No. 731,642
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 12 Claims

Coating compositions in which the vehicle is based upon an interpolymer of an unsaturated carboxylic acid amide and one or more other ethylenic monomers have a greatly reduced tendency to foam when there is included in the composition a small amount of aliphatic hydrocarbon wax modified with polyalkylene oxide. Such non-foaming characteristics permit the application of the coating composition by electrostatic spray systems or flow-coating techniques without coating defects caused by bubble formation.

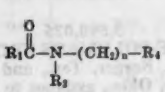
3,590,016

POLYMERIZABLE MONOMERS

John J. Hopwood, Glen Waverley, Victoria, Australia, assignor to Balm Paints Limited, Melbourne, Victoria, Australia

No Drawing. Filed July 28, 1969, Ser. No. 845,557
Claims priority, application Australia, Aug. 8, 1968, 41,874/68
Int. Cl. C08f *3/62, 15/00, 27/04*
U.S. Cl. 260—29.6 7 Claims

Novel polymerisable monomers which are ethylenically unsaturated esters of the formula:



wherein R_4 comprises a polymerisable ethylenic double bond. Homopolymers and copolymers of the monomers are disclosed and in one embodiment provide water-dispersible film-forming polymer which may be electrophoretically deposited on a conducting substrate.

3,590,017

POLY-N-ACYL-IMINES

Charles Bartell, Highland Park, Ivan Cutukovic Milutin, Chicago, Jules Downes Porsche, Clarendon Hills, and Robert John Rolih, Joliet, Ill., assignors to Borden, Inc., New York, N.Y.

No Drawing. Original application Dec. 27, 1965, Ser. No. 516,730, now Patent No. 3,475,196. Divided and this application July 11, 1969, Ser. No. 856,517
Int. Cl. C08g *20/00, 51/28*
U.S. Cl. 260—33.6 15 Claims

Polyimine-amide release coating agents particularly useful on pressure-sensitive adhesive tapes. The polyimine-amide release agents are poly-N-acyl-imines, which are acyl derivatives of polyalkylimines having a straight or branch chain, or acyl derivatives of a polyamide or a polyalkylimine and a dicarboxylic acid, wherein said polyamide has a plurality of primary or secondary amino groups.

3,590,018

ORGANOPHILIC CLAY

Stanley E. Gebura, Mountain Lakes, N.J., assignor to Interpace Corporation, Parsippany, N.J.

No Drawing. Filed May 29, 1968, Ser. No. 732,835
Int. Cl. C08f *45/06;* C08g *51/06;* C09c *1/28*
U.S. Cl. 260—40 15 Claims

A process has been provided for polymerizing a particular termonomer system onto surfaces of siliceous substances. By varying the component parts of the termonomer system, modified siliceous substances, such as clays and silicas, are obtained which may possess diverse properties, one from the other. Moreover, modified siliceous substances may be obtained with properties which meet specified requirements. Products prepared by this process are within the scope of the invention as are the uses of these surface modified products for purposes as adjuvants in poly(ester) and oleaginous composition formulations. The particular termonomer system consists of a major monomer, M_1; a monomer which regulates the polarity of the system, M_2; and a monomer, M_3, which cross-links and thus prevents displacement of the polymerizate of M_1, M_2 and M_3 from the surface of the siliceous substance when the siliceous substance is incorporated such as in poly(ester). An example of suitable termonomer systems is styrene, dimethylamino ethyl methacrylate and divinylbenzene in a weight ratio of 98:2:0.1, respectively.

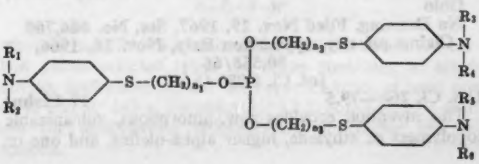
3,590,019

TRI(DIALKYLAMINOPHENYL THIOALKYLENE) PHOSPHITE STABILIZED OLEFIN POLYMER COMPOSITIONS

Hans Z. Lecher, Plainfield, N.J., and Harry Braus, Springdale, and Jay R. Woltermann, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Original application Dec. 21, 1967, Ser. No. 692,261, now Patent No. 3,504,056, dated Mar. 31, 1970. Divided and this application Oct. 16, 1969, Ser. No. 870,896
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.9 9 Claims

Olefin polymer compositions are stabilized with tri(dialkylaminophenyl thioalkylene) phosphites having the formula:



in which n_1, n_2 and n_3 are integers from two to about six; and R_1, R_2, R_3, R_4, R_5 and R_6 are alkyl having from one to about four carbon atoms alone or with hindered phenols and/or carbon black.

3,590,020

SILICONE RUBBER CURED BY DINITROSO AROMATIC COMPOUNDS

Gideon Levin, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Aug. 25, 1967, Ser. No. 663,248
Int. Cl. C08g *31/02*
U.S. Cl. 260—46.5 **3 Claims**

A composition curable to a silicone rubber resulting from a mixture of an organosilicon polymer and a dinitroso aromatic compound.

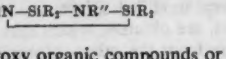
3,590,021

ORGANOSILAZANES

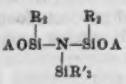
Richard P. Bush, Penarth, Glamorgan, Wales, assignor to Midland Silicones Limited, Reading, Berkshire, England

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,812
Claims priority, application Great Britain, Dec. 6, 1967, 55,485/67
Int. Cl. C03f *11/04*
U.S. Cl. 260—46.5E **14 Claims**

Cyclic organosilazanes of the general formula



are reacted with hydroxy organic compounds or hydroxysilicon compound (AOH) to produce linear compounds and polymers of the general formula



3,590,022

SYNTHETIC POLYAMIDE FIBER CONTAINING SAMARIUM AS A TRACER

Myron E. Gibson, Jr., Raleigh, and Ronald G. Garmon, Durham, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 17, 1967, Ser. No. 661,419
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 **2 Claims**

Synthetic fibers, such as nylon, polyesters, acrylics, etc., are made unmistakably identifiable by adding samarium, the presence of which, in amounts of between .005 and 50 parts per million, may be detected easily by neutron activation analysis. The samarium that is contained within the synthetic fiber is inactive and does not alter the fiber's chemical or physical properties, since its concentration is extremely low. When identification is desired, a sample of the fiber is exposed to neutron bombardment under standardized conditions and subsequently analyzed.

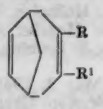
3,590,023

OLEFIN COPOLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Alberto Valvassori and Nazzareno Cameli, Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

No Drawing. Filed Nov. 29, 1967, Ser. No. 686,760
Claims priority, application Italy, Nov. 30, 1966, 30,558/66
Int. Cl. C08f *15/40*
U.S. Cl. 260—79.5 **17 Claims**

This invention provides new, amorphous, vulcanizable copolymers of ethylene, higher alpha-olefins, and one or more alkylbicyclononadienes which are 3,4-alkyl-bicyclo-(4,2,1)-nona-3,7-dienes of the formula



in which R and R^1 represent hydrogen or an alkyl group; and processes for obtaining the copolymers by polymerizing a mixture of the monomers in contact with catalysts which act with a mechanism of the coordinated anionic type.

3,590,024

METHOD OF PRODUCING RANDOM COPOLYMERS OF A CONJUGATED DIENE AND AN α-OLEFIN

Yuzo Ishizuka and Koichi Irako, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

No Drawing. Filed Aug. 20, 1969, Ser. No. 851,719
Claims priority, application Japan, Aug. 30, 1968, 43/61,743
Int. Cl. C08d *3/02*; C08f *15/04*
U.S. Cl. 260—85.3 **24 Claims**

A method of producing random copolymers of a conjugated diene and an α-olefin by contacting a mixture of said conjugated diene and said α-olefin with a catalyst system consisting of a component (A) of a compound selected from the group consisting of chlorides and bromides of titanium, and oxychlorides of vanadium, and a component (B) of an organoaluminum compound having the general formula AlR_3, wherein R represents a hydrocarbon radical, in the presence of a high molecular weight polyether, which promotes the copolymerization reactivity of the α-olefin.

3,590,025

POLYMERISATION OF FLUORINE-CONTAINING OLEFINS

Barry Tittle, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed July 8, 1968, Ser. No. 743,011
Claims priority, application Great Britain, July 12, 1967, 32,136/67
Int. Cl. C08f *3/24*
U.S. Cl. 260—92.1 **4 Claims**

Polymerisation of tetrafluoroethylene to solid polymers having melting points above 300° C., and differing from known polytetrafluoroethylene in their behaviour at temperatures of this order, by means of a catalyst system comprising antimony pentafluoride and a non-aqueous solvent at moderate temperatures and pressures, particularly 0°–50° C. and autogenous pressures. Examples of solvents are liquid sulphur dioxide, trifluoroacetic acid, fluorosulphonic acid and tetrafluoroethylene tetramer. The solvent appears to have some influence on the properties of the polymer. Reaction times are in the region of 30 minutes to two hours and inorganic catalyst residues are washed out of the polymers and the latter conveniently purified by heating with nitric acid.

3,590,026

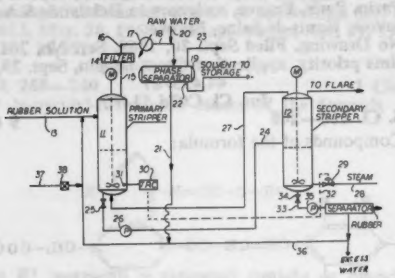
RECOVERY OF POLYMERS FROM SOLUTION

Rollin N. Carlson, Borger, Tex., and Weldin G. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 3, 1969, Ser. No. 788,766
Int. Cl. C08d *5/00*; C08f *1/92, 1/96*
U.S. Cl. 260—94.7 **4 Claims**

Recovery of polymers from solutions thereof in a hydrocarbon solvent by a steam stripping process in which

water containing magnesium or calcium ions is employed to increase effectiveness of dispersing agents employed to prevent agglomeration of polymers. The hard water is



introduced into the system at a location to accomplish the above object and to provide additional processing advantages.

3,590,027

PROCESS FOR PREPARING THYROCALCITONIN USING AN ACIDIC MIXTURE OF WATER AND A WATER-MISCIBLE ORGANIC SOLVENT

Edward L. Grinnan and Robert L. Wolen, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 619,910, Mar. 2, 1967. This application May 16, 1969, Ser. No. 825,436

Int. Cl. C07c *103/52*; C07g *7/100*

U.S. Cl. 260—112 6 Claims

A novel process for obtaining thyrocalcitonin from mammalian thyroid glands where a mixture of aqueous acid and a water-miscible organic solvent is used to extract the thyrocalcitonin.

3,590,028

ADRIAMYCIN DERIVATIVES

Federico Arcamone, Milan, Giuseppe Cassinelli, Rivanazzano, Pavia, and Aurelio di Marco and Marcello Gaetani, Milan, Italy, assignors to Società Farmaceutici Italia, Milan, Italy

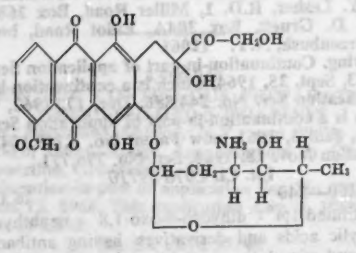
No Drawing. Filed Apr. 18, 1968, Ser. No. 722,221

Claims priority, application Italy, Apr. 18, 1967, 15,056/67

Int. Cl. C07c *47/18, 95/04*

U.S. Cl. 260—210 7 Claims

Described is the antibiotic "adriamycin" and its derivatives. "Adriamycin" has the formula



and is prepared by aerobic fermentation of mutant F.I. 106 of *Streptomyces peucetius*. The compounds show antitumoral activity on some mouse and rat tumors.

3,590,029

2-AMINO-ADENOSINE DERIVATIVES

Klaus Koch, Mannheim-Feudenheim, Erich Fauland and Kurt Stach, Mannheim-Waldhof, Max Thiel, Mannheim, and Wolfgang Schaumann and Karl Dietmann, Mannheim-Waldhof, Germany, assignors to Boehringer Mannheim Gesellschaft mit beschrankter Haftung, Mannheim-Waldhof, Germany

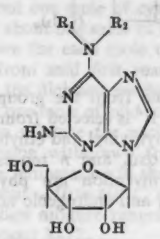
No Drawing. Filed Aug. 22, 1968, Ser. No. 754,745

Claims priority, application Germany, Aug. 25, 1967, B 94,161

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 7 Claims

Novel 2-amino-adenosine derivatives characterized by cardiac and circulatory activity and by their high coronary specificity having the following structural formula:



wherein R_1 is hydrogen, a substituted or unsubstituted, saturated or unsaturated, straight or branched chain aliphatic hydrocarbon radical, wherein said substituent is at least one of amino, alkylamino, dialkylamino, acylamino, alkoxy, acyloxy, hydroxy, mercapto, alkylmercapto, carboxy, carboxy alkyl or carboxamido and R_2 is a saturated or unsaturated cycloalkyl radical which can carry endo-alkylene radicals or annellated, saturated or unsaturated cyclic aliphatic hydrocarbon radicals or is the group A—X—B, wherein A is a substituted or unsubstituted, saturated or unsaturated, straight or branched chain, or cyclic aliphatic hydrocarbon radical, wherein said substituent is at least one of hydroxy, acyloxy, carboxy and aryl radicals, X is a valency bond, an oxygen or sulfur atom, alkylated imino or acylated imino, and B is a substituted or unsubstituted alkyl, alkenyi, aryl, furyl, pyridyl, indolyl or imidazolyl radical, wherein said substituent is at least one of halogen, alkyl, haloalkyl, alkoxy, aryloxy, acyloxy, hydroxy, mercapto, alkylmercapto, nitro, carboxy, carboxyalkyl and methylsulfonylamino radicals.

3,590,030

SULFENAMIDES OF CARBODITHIOIC ACID CONTAINING AZABICYCLONONANE

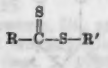
John Joseph D'Amico, Dunbar, W. Va., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 463,341, June 11, 1965, which is a continuation-in-part of application Ser. No. 426,348, Jan. 18, 1965. This application Jan. 30, 1968, Ser. No. 701,569

Int. Cl. C07d *41/04, 87/46*

U.S. Cl. 260—239 9 Claims

Compounds of the formula



where R and R′ are amino radicals of one to sixteen carbon atoms selected from the group consisting of alkylamino, dialkylamino, and heterocyclicamino, at least one of R and R′ being 3-azabicyclo[3.2.2]non-3-yl, and their use for accelerating vulcanization of rubber are described.

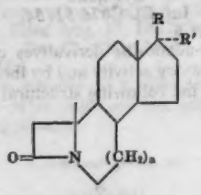
3,590,031

3,4-BISNOR-5-AZA-ANDROSTANES

Seymour D. Levine, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Nov. 20, 1967, Ser. No. 684,521
Int. Cl. C07d 39/00
U.S. Cl. 260—239 7 Claims

This invention relates to the preparation of novel steroidal β-lactams having the formula:



wherein R is selected from the group consisting of hydroxy and acyloxy, R' is selected from the group consisting of hydrogen, ethyl, vinyl and ethynyl, R and R' taken together represent oxo, and *n* represents 1 or 2. The β-lactams of this invention are physiologically active materials possessing anti-androgenic activity.

3,590,032

PRODUCTION OF CAPROLACTAM

Brian Walton Harris, Horley, England, assignor to BP Chemicals (U.K.) Limited, London, England

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,652
Claims priority, application Great Britain, Nov. 9, 1967, 51,095/67; July 16, 1968, 33,761/68
Int. Cl. C07d 41/06
U.S. Cl. 260—239.3 17 Claims

Caprolactam is produced by heating together 1,1'-peroxydicyclohexylamine and a lithium halide in a molten caprolactam environment.

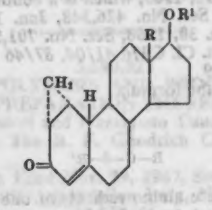
3,590,033

1α,2α - METHYLENE - 19 - NOR - TESTOSTERONE ETHERS AND 18-ALKYL HOMOLOGS THEREOF

Otto Engelfried, Hermann Steinbeck, and Rudolf Wiechert, Berlin, Germany, assignors to Schering AG, Berlin and Bergkamen, Germany

No Drawing. Filed Apr. 4, 1969, Ser. No. 815,259
Claims priority, application Germany, Apr. 5, 1968, P 17 68 161.7
Int. Cl. C07c 173/00
U.S. Cl. 260—239.55 5 Claims

1α,2α-methylene - 19 - nor-testosterone ethers and 18-alkyl homologs thereof characterized by favorable anabolic and minimal androgenic activity having the formula



wherein R represents lower alkyl and R^1 is tetrahydropyranyl or alkyl containing 1 to 4 carbon atoms. The substituent R can be methyl, ethyl, propyl, i-propyl, butyl, pentyl, hexyl and the like.

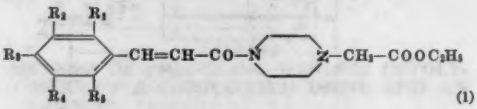
3,590,034

AMIDES DERIVED FROM PIPERAZINE-1-ACETIC ACID AND ESTERS THEREOF AND PROCESS FOR OBTAINING SAME

Claude Fauran, Paris, Gerard Huguet, Malesherbes, Guy Raynaud, Paris, Bernard Pourrias, Meudon, and Michel Turin, Paris, France, assignors to Delalande S.A. Courbevoie, Hauts-de-Seine, France

No Drawing. Filed Sept. 20, 1968, Ser. No. 761,325
Claims priority, application Great Britain, Sept. 29, 1967, 44,435/67
Int. Cl. C07d 51/70
U.S. Cl. 260—240 9 Claims

Compounds of the formula:



(1)

in which R_1, R_2, R_3, R_4 and R_5, which may be the same or different, each represent a hydrogen atom, a halogen atom (F, Cl, Br), an alkyl radical having one to five carbon atoms, a lower alkoxy radical, a methylenedioxy group and R represents a saturated or unsaturated, straight or branched-chain, alkyl radical having one to six carbon atoms and a process for preparing same which involves reacting an ester of 1-piperazine acetic acid with a halogenated cinnamoyl in the presence of an alkaline agent. The compounds have a coronaro-dilatory action, a hypotensive action, an antiangiotensin activity, a vasodilatory activity, an antiarythmic activity and/or a diuretic action.

3,590,035

PROCESS FOR PREPARING PYRIDINE N-OXIDE CARBANION SALTS

Ralph A. Damico, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Dec. 21, 1967, Ser. No. 692,274
Int. Cl. C07d 31/24
U.S. Cl. 260—290 8 Claims

Process for preparing 2-pyridine N-oxide carbanion salts, 2-pyridinethiol N-oxides, salts thereof and 2,2'-dithiopyridine N,N-dioxides which comprises the steps of (1) reacting a pyridine N-oxide with a strong base at from −70° to 150° C. to form a novel pyridine N-oxide carbanion salt and (2) reacting the carbanion salt formed with a sulfur-containing reagent.

3,590,036

NAPHTHYRIDINE-3-CARBOXYLIC ACIDS, THEIR DERIVATIVES AND PREPARATION THEREOF

George Y. Lesher, R.D. 1, Miller Road, Box 268, and Monte D. Gruett, Box 304A, Elliot Road, both of East Greenbush, N.Y. 12061

No Drawing. Continuation-in-part of application Ser. No. 399,333, Sept. 25, 1964, which is a continuation-in-part of application Ser. No. 244,886, Dec. 17, 1962, which in turn is a continuation-in-part of application Ser. No. 79,951, Jan. 3, 1961, now Patent No. 3,149,104. This application Nov. 18, 1968, Ser. No. 776,771
Int. Cl. C07d 39/10
U.S. Cl. 260—240 26 Claims

1-substituted-1,4 - dihydro-4-oxo-1,8 - naphthyridine-3-carboxylic acids and derivatives, having antibacterial, sedative and stimulatory activities, are prepared by various means, e.g., by reacting the corresponding 4-hydroxy-1,8-naphthyridine-3 - carboxylic acid or derivative with various alkyl or substituted-alkyl esters of a strong acid.

3,590,037

N-PYRIDYL-FORMIMINO ETHERS

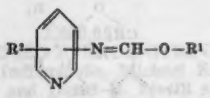
Pal Benko, 7 Parcsay Vilmos utca; Laszlo Pallos, 8a Ugocsa utca; and Ferenc Ordogh, 25–27 Ozike utca, all of Budapest XII, Hungary; and Julianna Rosdy, nee Kiss, 5 Muk S. utca, Budapest XIII, Hungary

No Drawing. Continuation-in-part of application Ser. No. 717,013, Mar. 28, 1968. This application Apr. 21, 1970, Ser. No. 30,591

Int. Cl. C07d *31/42*

U.S. Cl. 260—240 1 Claim

New N-pyridyl-formimino ethers of the formula



wherein R^1 represents a saturated straight or branched chain alkyl group of 7 to 16 carbon atoms, a cycloalkyl group of 5 to 6 carbon atoms, a benzyl or phenylethyl group or a dimethylaminoethyl or diethylaminoethyl radical and R^2 represents hydrogen, halogen, nitro or lower alkyl. The new compounds are useful as anthelmintics and cercaricides.

3,590,038

PHENOTHIAZINYL-LOWER-ALKYLAMIDOXIMES AND -GUANIDINES

Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 631,871, Apr. 19, 1967, which is a continuation-in-part of application Ser. No. 519,458, Jan. 10, 1966, which in turn is a continuation-in-part of application Ser. No. 345,846, Feb. 19, 1964. This application Nov. 26, 1968, Ser. No. 779,211

Int. Cl. C07d *93/14*

U.S. Cl. 260—243 18 Claims

New phenothiazinyl-lower-alkylamidoximes and -guanidines having useful sedative and psychomotor stimulant activities.

3,590,039

N - (α,α,α,α',α',α' - HEXAFLUORO - 3,5 - XYLYL) ANTHRANILIC ACID AND SALTS THEREOF

Alfred Sallmann, Bottmingen, and Rudolf Pfister, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,485

Claims priority, application Switzerland, Dec. 20, 1967, 17,890/67

Int. Cl. C07c *101/54*

U.S. Cl. 260—247.2 2 Claims

N-(α,α,α,α',α',α'-hexafluoro-3,5-xylyl) - anthranilic acid and pharmaceutically acceptable salts thereof with a base are active ingredients in pharmaceutical compositions useful for the treatment of inflammatory diseases.

3,590,040

PROCESS FOR CONTINUOUS PREPARATION OF AMINO-CHLORO-S-TRIAZINES

John F. Ferguson, Ardsley, N.Y., and Philip G. McCracken, Baton Rouge, La., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

Continuation-in-part of application Ser. No. 513,181, Dec. 13, 1965. This application Aug. 6, 1969, Ser. No. 850,320

Int. Cl. C07d *55/48*

U.S. Cl. 260—249.5 11 Claims

A continuous process for producing first an intermediate 2,4-dichloro-6-lower alkylamino-s-triazine and then therefrom a 2-chloro-4,6-bis lower alkylamino-s-triazine herbicide. A first reaction mixture is established and maintained in which cyanuric chloride in organic solvent solution is reacted in a substantially non-aqueous medium with a lower alkylamine to form a 2,4-dichloro-6-lower alkylamino-s-triazine and hydrochloric acid. An organic solvent solution of cyanuric chloride, an amine to be reacted therewith, and an acid acceptor are continuously and simultaneously added to the first reaction mixture. An organic solvent solution of a 2,4-dichloro-6-lower alkylamino-s-triazine is continuously withdrawn from the first reaction mixture and continuously added with a lower alkylamine and an acid acceptor to a second reaction mixture. A solvent solution of a 2-chloro-4,6-bis-lower alkylamino-s-triazine is continuously withdrawn from the second reaction mixture and the latter diamino compound is recovered from its solution. The amount of reactants used is equivalent to about one mole of cyanuric chloride, one mole of amine and about one mole of acid acceptor in the first reaction mixture for each mole of dichloro product being withdrawn from said first reaction mixture, and about one mole of the dichloro product, about one mole of amine and about one mole of acid acceptor are added to the second reaction mixture for each mole of diamino reaction product being withdrawn from the second reaction mixture. The temperature in the first reaction mixture ranges from about —10 to 60° C. and the temperature of the second reaction mixture ranges from about 20 to 90° C. The pH is about 9–12.

3,590,041

NOVEL HALO-SUBSTITUTED CINNAMIC ACID HETEROCYCLIC AMIDES

Manfred Kleemann, Wolfgang Grell, Gerhard Dahms, Hans Machleidt, and Albrecht Eckenfels, Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim, Germany

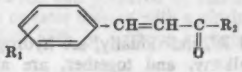
No Drawing. Continuation-in-part of application Ser. No. 777,889, Nov. 21, 1968. This application Dec. 15, 1969, Ser. No. 885,256

Claims priority, application Austria, Dec. 1, 1967, A 10,911/67; Nov. 5, 1968, A 10,755/68, A 10,756/68; May 23, 1969, A 4,946/69

Int. Cl. C07d *29/14, 87/30*

U.S. Cl. 260—240 3 Claims

Compounds of the formula



wherein:

R_1 is chlorine, bromine or iodine, preferably in 4-position, and

R_2 is piperidino, 4-hydroxy-piperidino or morpholino, with the proviso that when R_1 is chlorine, R_2 is only 4-hydroxy-piperidino,

useful as antiphlogistics and antipyretics is warm-blooded animals.

3,590,042

N-s-TRIAZYL IMIDES OF HALO SUBSTITUTED POLYHYDROPOLYCYCLICDICARBOXYLIC ACIDS

Henry A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Sept. 5, 1968, Ser. No. 757,777

Int. Cl. C07d *55/22*

U.S. Cl. 260—249.6 8 Claims

Novel compositions of matter comprising N-s-triazyl imides of halo-substituted polyhydropolycyclicdicarboxylic acids as exemplified by 2-N-(5,6,7,8,9,9-hexachloro-1,2,3,4,4a,5,8,8a-octahydro-5,8-methano - 2,3 - naphthalenedi-

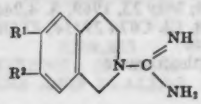
carboximido)-4,6-diamino-s-triazine are useful as additives for plastics, polymers, resins, etc. whereby flameproof or fire-retardant properties are added thereto.

3,590,043
CONDENSED ISOINDOLONE DERIVATIVES
Wilfried Graf, 63 Schweissbergweg, Binningen, Basel-Land, Switzerland
No Drawing. Continuation-in-part of application Ser. No. 578,494, Sept. 12, 1966. This application Oct. 30, 1968, Ser. No. 771,972
Claims priority, application Switzerland, Sept. 21, 1965, 13,013/65; Sept. 21, 1966, 13,633/66
Int. Cl. C07d *57/02, 57/14*
U.S. Cl. 260—250.4 8 Claims

Substituted tetrahydro-imidazo-, tetrahydro-pyridazo- and hexahydro-diazepino-isoindolone derivatives having an amino-alkanoyl group in 1-position are prepared by amination of the corresponding compounds having a halogeno-alkanoyl group in 1-position; also embraced are pharmaceutically acceptable acid addition salts, quaternary salts and the N-oxides; these compounds have anti-inflammatory, spasmolytic and antitussive activities; they are the active ingredients of pharmaceutical compositions and can be used for the treatment of inflamamtory diseases, spasms and tussive irritations; an illustrative embodiment is 1-(N-propyl-N-benzylglycyl)-9b-phenyl-1,2,3,9b-tetrahydro-5H-imidazo[2,1-a]isoindol-5-one.

3,590,044
PROCESS FOR THE PREPARATION OF 1,2,3,4-TETRAHYDROISOQUINOLINE-2-CARBOXAMIDINES
Charles William Den Hollander, Midland Park, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Aug. 19, 1966, Ser. No. 573,485
Int. Cl. C07d *33/50*
U.S. Cl. 260—288 6 Claims

1,2,3,4-tetrahydro-isoquinolin-2-carboxamidines of the formula



(I)

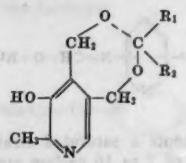
wherein R^1 and R^2, individually, are hydrogen, hydroxyl and lower alkoxy, and together, are alkylenedioxy, are prepared from the corresponding 1,2,3,4-tetrahydroisoquinoline by treatment with cyanamide in an aqueous alcoholic medium at a controlled pH. The end products are useful as hypotensive agents.

3,590,045
CERTAIN SUBSTITUTED IMIDAZO (4,5-b) PYRIDINES
Berthold Richard Vogt, King of Prussia, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.
No Drawing. Original application May 18, 1967, Ser. No. 639,268. Divided and this application Sept. 25, 1969, Ser. No. 871,072
Int. Cl. C07d *31/44, 31/46*
U.S. Cl. 260—295 5 Claims

Novel 2-acylaminoimidazo [4,5-b] pyridines, which may be optionally substituted on the pyridine nucleus, having activity against helminthiasis in animals are disclosed. A process for their preparation involves reacting an optionally substituted o-diaminopyridine with an acyl-S-lower alkyl pseudothiourea.

3,590,046
PROCESS FOR THE PREPARATION OF PYRIDOXIN 5'-PHOSPHATE
Sidney Frank Schaeren, Bottmingen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Nov. 20, 1968, Ser. No. 777,480
Claims priority, application Switzerland, Dec. 15, 1967, 17,646/67
Int. Cl. C07d *31/28*
U.S. Cl. 260—297V 12 Claims

Pyridoxin 5'-phosphate is prepared by treatment of an acetal or ketal of the formula



I

with polyphosphoric acid followed by hydrolyzation of the polyphosphate thus obtained with water.

3,590,047
2-BENZOYLBENZIMIDAZOL-1-YLACETIC ACIDS
Tsung-Ying Shen, Westfield, and Alexander R. Matzuk, Colonia, N.J., and Harvey Schwam, Flushing, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of application Ser. No. 598,607, Dec. 2, 1966. This application Oct. 18, 1968, Ser. No. 768,883
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 5 Claims

2-benzoylbenzimidazol-1-ylacetic acids and derivatives are prepared which have anti-inflammatory properties.

3,590,048
SUBSTITUTED THIOPYRANO[2,3-c]PYRAZOLES
Leo Ralph Swett and James Daniel Rafajczyk, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.
No Drawing. Filed Apr. 1, 1968, Ser. No. 717,813
Int. Cl. C07d *65/08*
U.S. Cl. 260—310 4 Claims

1,3-disubstituted - 5,6 - dihydrothiopyrano[2,3-c] pyrazoles are synthesized from the new 3-[(1,3-disubstituted-5 - pyrazolyl)thio]propionic acids described. The new fused-ring compounds have excellent anti-inflammatory activity; they relieve edemas and are also useful as antipyretics and analgesics.

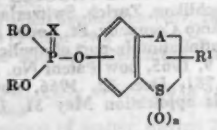
3,590,049
2'-ACYL-2-AMINOXYACETANILIDE HAVING 2-AMINO FUNCTION PROTECTED
Arthur Stempel, Teaneck, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Application Dec. 6, 1966, Ser. No. 600,347, now Patent No. 3,420,817, dated Jan. 7, 1969, which is a continuation-in-part of application Ser. No. 522,397, Jan. 24, 1966. Divided and this application Oct. 18, 1968, Ser. No. 768,910
Int. Cl. C07d *27/52*
U.S. Cl. 260—326 14 Claims

2'-acyl-2-aminoxyacetanilide having the 2-amino function protected and substituted derivatives thereof. These compounds are intermediates in the preparation of 4,1,5-benzoxadiazocin-2-ones (A) which compounds are convertible into 3-hydroxy-1,4-benzodiazepin-2-ones (B). Both compound A and compound B are active as anticonvulsants, muscle relaxants and sedative agents.

3,590,050
INDOLE INTERMEDIATES
Torleif Utne, Bound Brook, Ronald B. Jobson, Old Bridge, and Alfred V. Lovell, Roselle, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Nov. 22, 1968, Ser. No. 778,340
Int. Cl. C07d 27/16
U.S. Cl. 260—326.3 2 Claims
The process for synthesizing 3-indolyl acetic acid compounds through the preparation of novel intermediate lactam and levulinic acid compounds is described.

3,590,051
MODIFIED PYRROLNITRINS
Marvin Gorman, Indianapolis, Michael E. Haney, Jr., West Lafayette, and David H. Lively and James D. Davenport, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Continuation-in-part of application Ser. No. 533,787, Mar. 14, 1966, now Patent No. 3,476,648. This application July 27, 1967, Ser. No. 656,514
Int. Cl. C07d 27/22
U.S. Cl. 260—326.9 5 Claims
Modified derivatives of pyrrolnitrin comprising 4-substituted phenyl-3-chloropyrroles, in which the 4-substituent is a halo-, trifluoromethyl-, or methyl-substituted aminophenyl or nitrophenyl group, and a process for the production thereof by the addition of a tryptophane, substituted in the 5-, 6- or 7-position by halogen, trifluoromethyl, or methyl, to a fermentation medium suitable for the culture of a pyrrolnitrin-producing organism. The compounds are useful as antibacterial and antifungal agents.

3,590,052
PHOSPHORYLATED DIHYDROBENZOTHIOPHENES AND THIACHROMANS
Michael D. Barker, Maidstone, Kent, England, assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Mar. 12, 1969, Ser. No. 806,720
Claims priority, application Great Britain, Mar. 28, 1968, 14,970/68
Int. Cl. A01n 9/36; C07d 63/22, 65/14
U.S. Cl. 260—327 6 Claims
Phosphorylated dihydrobenzothiophenes and thiachromans of the formula



wherein X is oxygen or sulfur, A is a covalent bond or methylene, each R is individually an alkyl group, R^1 is hydrogen or an alkyl group and *n* is 0 or 1, are useful as insecticides.

3,590,053
METHOD OF PRODUCING 3,7-DIMETHYL-6,7-EPOXY-OCTAN-1-AL
George Oswald Chase, Hawthorne, and Alfred Alfonse Pilarz, Lincoln Park, N.J., assignors to Givaudan Corporation, Clifton, N.J.
No Drawing. Filed Mar. 11, 1968, Ser. No. 711,910
Int. Cl. C07d 1/00, 1/12
U.S. Cl. 260—348 10 Claims
A new and improved method for porducing 3,1-dimethyl-6,7-epoxy-octan-1-al from a dialkanoyl derivative of 3,7-dimethyl-2,6-octadien-1-al or from a mono alkanoyl derivative of 3,7 - dimethyl - 1,2,6 - octatrien-1-ol and intermediates therein are disclosed.

3,590,054
2-(2,4-DICHLOROPHENOXYACETYL)-4-METHYL-1,2,4-OXADIAZOLIDINE-3,5-DIONE
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.
No Drawing. Filed Aug. 28, 1969, Ser. No. 853,945
Int. Cl. C07d 85/00
U.S. Cl. 260—307 1 Claim
This invention discloses the compound 2-(2,4-dichlorophenoxyacetyl)-4-methyl-1,2,4-oxadiazolidine - 3,5-dione and its use as a herbicide. Further disclosed are the compounds potassium 4-methyl-1,2,4-oxadiazolidine-3,5-dione and sodium 4-methyl-1,2,4-oxadiazolidine-3,5-dione.

3,590,055
PLICATENOL PRODUCT AND PROCESS
John Howard, Vancouver, British Columbia, Canada, assignor to ITT Rayonier Incorporated, New York, N.Y.
No Drawing. Original application May 27, 1968, Ser. No. 732,053, now Patent No. 3,502,702, dated Mar. 24, 1970. Divided and this application Aug. 14, 1969, Ser. No. 870,864
Int. Cl. C11b 5/00
U.S. Cl. 260—398.5 1 Claim
A new composition of matter comprising 1-(3',4'-dihydroxy-5'-methoxyphenyl) - 2,7-dihydroxy-3-methyl-6-methoxy-naphthalene ("plicatenol") having utility as an antioxidant for fats and oils is disclosed. This compound is prepared by heating plicatin (a derivative of plicatic acid) to a temperature of about 200° C. in the absence of air for a sufficient period of time to produce a pyrolysis reaction product comprising plicatenol.

3,590,056
LOW MOLECULAR WEIGHT THIODIPROPIONIC POLYESTERS
Clarence T. Tholstrup, Alan Bell, and Charles J. Kibler, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 513,593, Dec. 13, 1965, now Patent No. 3,466,323, which is a continuation-in-part of applications Ser. No. 77,862, Dec. 23, 1960, now Patent No. 3,157,517, and Ser. No. 309,339, Sept. 16, 1963. This application Sept. 8, 1969, Ser. No. 856,146
Int. Cl. C07c 69/78, 149/20
U.S. Cl. 260—399 8 Claims
Low molecular weight polyesters useful as stabilizers for organic materials and prepared by condensing a thiodipropionic acid or ester thereof with a diprimary sterically hindered glycol with or without a chain terminating agent.

3,590,057
[α-(C_5–C_{17})ALKYL]BENZYL FATTY ACID AMIDES AS CHOLESTEROL LOWERING AGENTS
Yoshio Suzuki, Amagasaki-shi, Yasushi Nakamura, Ibaragi-shi, Toshitsugu Fukumaru, Kyoto, Noritaka Hamma, Nishinomiya-shi, Michio Kimura, Minoo-shi, Shunji Aono, Toyonaka-shi, and Hideaki Fukushima, Nishinomiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
No Drawing. Filed Dec. 3, 1968, Ser. No. 7880,876
Claims priority, application Japan, Dec. 21, 1967, 42/82,279
Int. Cl. C09f 7/00
U.S. Cl. 260—404 15 Claims
A novel fatty acid amide having action to lower cholesterol in the blood which is composed of an α-alkylbenzylamine containing in the α-position an alkyl group having 5–17 carbon atoms and a monocarboxylic acid containing a saturated or unsaturated hydrocarbon group having 15–19 carbon atoms. The fatty acid amide is prepared by reacting said monocarboxylic acid, a reactive derivative thereof or natural fat with said α-alkylbenzylamine.

3,590,058

ATOMIZED HYDROCARBON OXYGENATION REACTION PROCESS AND APPARATUS THEREFOR

Elmer J. LeMaster, Rte. 1, Box 17, Franklin Furnace, Ohio 45629

Continuation-in-part of application Ser. No. 572,288, Aug. 15, 1966. This application June 7, 1968, Ser. No. 735,363

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 9 Claims

A method is disclosed for the oxygenation of liquid hydrocarbon compounds to fatty acids and other oxygenated compounds by atomizing a preheated and pressurized mixture of the hydrocarbon, steam, and air to a vapor-foam, and passing such vapor-foam mixture through a catalytic bed at a temperature above atmospheric temperature but below the boiling point of the hydrocarbon. The vapor-foam is usually a combination of vapor and foam but may be all foam or substantially all vapor.

Several forms of apparatus are disclosed. In each form disclosed, a reaction vessel is provided having a catalytic bed therein and an atomizer is provided within the vessel in order to form the liquid into a vapor-foam prior to passage through the catalytic bed. In two of the apparatus, the hydrocarbon material, steam, and air enter the reaction vessel, and are atomized near the top thereof and then pass through the catalytic bed and move out of the reaction vessel at the bottom, going from there to an accumulator where the product is settled and separated. In one arrangement, the flow is reversed so that the materials move upward through the reaction vessel. Several types of heat exchangers are shown for preheating the materials to be reacted either utilizing the heat from the reaction (which is normally exothermic) or utilizing hot water or steam.

3,590,059

PROCESS FOR THE PURIFICATION OF EDIBLE OILS

Maurice Eugene Velan, Marseille, France, assignor to Salador-Huileries Antonin Roux-Savonneries J. B. Paul-Savonneries de Bourgogne, Saint-Ouen, France

Continuation of abandoned application Ser. No. 664,725, Aug. 31, 1967. This application Sept. 11, 1969, Ser. No. 857,655

Int. Cl. C11b *3/04*

U.S. Cl. 260—423 14 Claims

In a process for the purification of vegetable and animal oils comprising the successive operations of bleaching by means of bleaching earth and carrying off the fatty acids contained in the oil by means of steam under vacuum, the improvement which consists, before bleaching the oil, in treating the oil with a small amount of acid, more particularly of an organic nature, at a temperature of the order of 50 to 80° C. and adjusting the moisture level of the oil at a value ranging between 0.1 and 0.5%; optionally, the above-mentioned acid treatment may be preceded by treatment of the crude oil with a small amount of an alkaline agent and centrifuging with the object of eliminating the alkalized impurities.

3,590,060

FLUOROALKYLTIN COMPOUNDS

Robert M. Murch, Ashton, Md., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,028

Int. Cl. C07f *7/22*; C08f *45/56*; A01n *9/00*

U.S. Cl. 260—429.7 5 Claims

Monomeric tin compounds, containing at least one 3,3,3-trifluoropropyl substituent are disclosed. These compounds find utility as stabilizers for polyvinyl resins, catalysts, pesticides, bactericides and oil repellants.

3,590,061

BIS(TRIHYDROCARBYLTIN)PHTHALATES

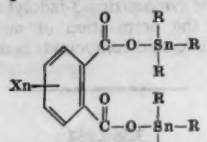
Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed Feb. 24, 1969, Ser. No. 801,850

Int. Cl. C07f *7/22*; C08f *45/62*; A01n *9/24*

U.S. Cl. 260—429.7 2 Claims

Organotin compounds that have the structural formula



wherein each R represents phenyl or an alkyl group having from 4 to 8 carbon atoms, X represents an alkyl group having from 1 to 4 carbon atoms, chlorine, phenyl, or nitro, and *n* represents an integer in the range of 1 to 4, effectively control the growth of undesirable organisms. Illustrative of these compounds is bis(tri-n-butyltin)3,4-dimethyl-6-isobutylphthalate.

3,590,062

PROCESS FOR PREPARING COBALT ORGANO-METALLIC COMPLEX COMPOUNDS

Giacomo Costa and Giovanni Mestroni, Trieste, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,116

Claims priority, application Italy, Sept. 21, 1967, 20,725/67

Int. Cl. C07f *15/06*

U.S. Cl. 260—439 9 Claims

A process is disclosed for preparing compounds of the formula R.O.CO.Co (chel) where R is a hydrocarbon radical and (chel) is a tetradentate chelating agent bound to the cobalt ion which comprises either:

(a) mixing the compound CoX_2 where X is a monovalent ion with chelating agent (chel) in solvent ROH; or

(b) dissolving compound Co^{II} (chel) in solvent ROH; and contacting the resulting solution from (a) or (b) with carbon monoxide.

3,590,063

ORGANIC 1,3-DISILYL-1,3,2,4-DIAZADISILETIDINES AND PROCESS

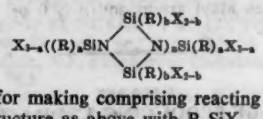
Walter Fink, Ruschlikon, Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of applications Ser. No. 591,418, Nov. 9, 1965, now Patent No. 3,468,922, and Ser. No. 600,781, Dec. 12, 1966, now Patent No. 3,414,584. This application May 31, 1968, Ser. No. 733,329

Int. Cl. C07f *7/02*

U.S. Cl. 260—448.2N 9 Claims

Organic 1,3 - disilyl - 1,3,2,4 - diazadisiletidines of the formula



and process for making comprising reacting a compound of similar structure as above with R_aSiX_{4-a} to exchange silyl groups external and/or internal of the silazane ring.

3,590,064

PROCESS FOR PREPARING CYCLOSILOXANES

Charles W. Lacefield, % Dow Corning Corp., Midland, Mich. 48640

No Drawing. Filed July 23, 1969, Ser. No. 844,165

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2E 13 Claims

A process for preparing cyclosiloxanes having at least three silicon atoms which involves the reaction of a halo-

gen endblocked linear polysiloxane with at least a stoichiometric amount of an alkali metal carbonate salt in the presence of a suitable polar solvent. The reaction is exothermic and is preferably conducted at room temperature.

3,590,065
METHOD OF PREPARING MERCAPTOALKYLALKOXY SILANES
Joseph A. Rakus, Freeland, and James G. Sharpe, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed July 18, 1969, Ser. No. 843,205
Int. Cl. C07f 7/18
U.S. Cl. 260—448.8R 4 Claims

Mercaptoalkylalkoxy silances are prepared by the simultaneous reaction of chloroalkylalkoxy silanes, thiourea or tetramethyl thiourea and ammonia, at a temperature of 100 to 145° C. The reaction is characterized by excellent yields of the desired mercaptoalkylalkoxy silanes without the necessity of using solvent and without the formation of undesired by-products. For example, chloropropyl-trimethoxysilane is reacted with thiourea and ammonia at 125° C. to produce mercaptopropyltrimethoxysilane and guanidine hydrochloride.

3,590,066
HYDROCARBYL BORATE PRODUCTION USING OZONE
Hans D. Holtz, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Sept. 12, 1966, Ser. No. 578,479
Int. Cl. C07f 5/04
U.S. Cl. 260—462 3 Claims

Hydrocarbyl borates are produced by reacting saturated hydrocarbons with oxygen and a boron-containing compound in the presence of ozone and in a solvent medium.

3,590,067
POLYNITRO HALO COMPOUNDS USEFUL AS ANTIBIOTICS, FUNGICIDES AND EXPLOSIVES
Marvin H. Gold, Sacramento, and Henry J. Marcus, West Covina, Calif., assignors to Aerojet-General Corporation, Azusa, Calif.
No Drawing. Original application Nov. 26, 1963, Ser. No. 326,286, now Patent No. 3,359,334, dated Dec. 19, 1967. Divided and this application Jan. 3, 1967, Ser. No. 616,147
Int. Cl. C07c 69/00; A01n 9/24
U.S. Cl. 260—463 1 Claim

A new composition of matter, methyl 2,2-dinitropropyl carbonate, is disclosed, having fungicidal activity.

3,590,068
ACRYLONITRILES
Werner Toepfl, Basel, and Marcus von Orelli, Munchenstein, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Filed Sept. 29, 1966, Ser. No. 584,052
Claims priority, application Switzerland, Oct. 7, 1965, 13,803/65
Int. Cl. C07c 121/30, 121/40, 121/70
U.S. Cl. 260—465.4 3 Claims

Acrylonitriles having the formula

wherein X is chloro, bromo, substituted mercapto, amino or substituted amino or a heterocyclic radical, Y is chloro or bromo and Z is an esterified carboxylic acid group or a carboxamido group substituted or unsubstituted. Such compounds are useful as pesticides particularly as molluscicides.

3,590,069
METHOD FOR THE PREPARATION OF 2-METHYLENEGLUTARONITRILE
Joseph W. Nemec, Rydal, and Richard B. Wuchter, Jenkintown, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.
No Drawing. Filed Feb. 1, 1966, Ser. No. 523,966
Int. Cl. C07c 12/30
U.S. Cl. 260—465.8 8 Claims

A method for preparing 2-methyleneglutaronitrile by dimerizing acrylonitrile in the presence of a catalyst defined by the formula

$$(R'R''N)_3P$$

or

$$(R'R''N)_2PR'''$$

wherein the symbols R' and R'' may be the same or different within any one compound.

R' and R'' represent alkyl groups of 1 to 18 carbon atoms joined to the nitrogen atom at a primary carbon atom.

R' and R'', collectively with the nitrogen atom to which they are attached, may form a saturated cyclic amine group containing up to 5 carbon atoms in the ring, optionally containing 1 or more alkyl substituents having a total of up to 6 carbon atoms.

3,590,070
RECYCLE OF TEREPHTHALIC ACID IN THE PRODUCTION OF A BIS(2-HYDROXYALKYL) TEREPHTHALATE
Preston K. Martin and John P. Mireur, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.
Filed June 3, 1968, Ser. No. 733,849
Int. Cl. C07c 69/82
U.S. Cl. 260—475P 13 Claims

A process for reacting terephthalic acid with an alkylene oxide in an inert halohydrocarbon or alkylbenzene liquid reaction medium wherein the terephthalic acid-containing wetted solids separated from the reaction zone are recycled by slurry the wetted solids in the liquid reaction medium and pumping them to the reaction zone. In recycling the wetted solids of the slurry, care must be taken to avoid temperatures of 90–105° C. in the case of an alkylbenzene liquid medium or 80 to 100° C. when using a halohydrocarbon liquid medium.

3,590,071
PRODUCTION OF BIS-HYDROXYALKYL ESTERS OF BENZENE DICARBOXYLIC ACIDS
Donald R. Larkin, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.
No Drawing. Filed Feb. 16, 1968, Ser. No. 705,937
Int. Cl. C07c 69/82
U.S. Cl. 260—475P 14 Claims

The process for the production of bis-hydroxyalkyl phthalates by reacting an alkylene oxide with a benzene dicarboxylic acid in the presence of a catalyst and in a nitrobenzene or nitrotoluene reaction medium. For example ethylene oxide is reacted with terephthalic acid in a nitrobenzene reaction medium using a tertiary amine catalyst so as to produce bis(2-hydroxyethyl) terephthalate.

3,590,072

METHOD FOR DIRECT ESTERIFICATION OF TEREPHTHALIC ACID WITH ETHYLENE GLYCOL

Allen E. Leybourne III, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 18, 1966, Ser. No. 595,480
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 10 Claims

A slurry of terephthalic acid in ethylene glycol is maintained below 100° C. until being introduced into a reaction zone maintained at a temperature of 200–290° C. The cool slurry prevents agglomeration of the terephthalic acid with consequent plugging of the slurry feed lines.

3,590,073

ESTERIFICATION OF TERTIARY ALCOHOLS

Lawrence J. Carr, Glenolden, Rudolph Rosenthal, Broomall, and Giovanni A. Bonetti, Wynnewood, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,777
Int. Cl. C07c *67/00*
U.S. Cl. 260—476R 10 Claims

Method for the esterification of aliphatic acyclic tertiary alcohols having from 4 to 8 carbon atoms by reacting the alcohol with an organic carboxylic acid in the presence of a cation exchange resin.

3,590,074

CHLOR-METHYL-ISOPROPYL-PHENYL-N-METHYL CARBAMATE

Rudolf Heiss, Rueckersdorf, Ernst Bocker, Leverkusen, Bernhard Homeyer, Opladen, and Ingeborg Hammann, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 1, 1968, Ser. No. 749,263
Claims priority, application Germany, Aug. 7, 1967, F 53,157
Int. Cl. C07c *101/12*
U.S. Cl. 260—479 1 Claim

2-chloro-4-methyl-5-isopropyl-phenyl - N - methyl carbamate which possesses insecticidal properties and which may be produced by commercial methods.

3,590,075

COPOLYMERIZATION OF CARBON MONOXIDE WITH ALKYLENE OXIDE

George L. Bata and Kshatra Pati Singh, Montreal, Quebec, Canada, assignors to Union Carbide Canada Limited, East Toronto, Ontario, Canada

No Drawing. Filed Sept. 22, 1967, Ser. No. 669,716
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 8 Claims

Copolymers of carbon monoxide and alkylene oxides are prepared by polymerizing the monomers at elevated temperature and pressure in the presence of a catalyst system comprising a salt of a Group VIII metal and a nitrogen-containing compound selected from amines and alkanolamines. The salts are preferably halides or carbonates.

3,590,076

WAX-ANHYDRIDE COMPOUNDS

William J. Heintzelman and Michael I. Naiman, St. Louis County, Mo., assignors to Petrolite Corporation, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 527,075, Feb. 14, 1966. This application Jan. 9, 1967, Ser. No. 607,877
Int. Cl. C07c *69/40*
U.S. Cl. 260—485 5 Claims

Wax-anhydride compounds and derivatives thereof, including amides, esters, etc.; processes by which they are prepared; and uses thereof, including their use as carbon paper inks, polishes, etc.

3,590,077

SALTS OF CHRYSANTHEMIC ACID WITH 1-p-NITROPHENYL - 2-N,N - DIMETHYL-AMINO-PROPANE-1,3-DIOLS

Georges Muller, Nogent-sur-Marne, Gaston Amiard, Thorigny, Andre Poittevin, Les Lilas, and Vesperto Torelli, Maisons Alfort, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Continuation-in-part of application Ser. No. 610,219, Jan. 19, 1967. This application July 5, 1968, Ser. No. 742,485
Claims priority, application France, Jan. 26, 1966, 47,305; July 7, 1967, 113,580
The portion of the term of the patent subsequent to Mar. 9, 1987, has been disclaimed
Int. Cl. C07c *91/20*
U.S. Cl. 260—501.17 4 Claims

Optical isomers of 1-p-nitrophenyl-2-N,N-dimethylamino-propane-1,3-diol and acid addition salts thereof, useful for the separation of racemic compounds and preparation thereof.

3,590,078

PROCESS FOR PRODUCTION OF ALKALI METAL SALTS OF TEREPHTHALIC ACID

Tamotsu Murase, Ichiro Mikami, Kyohei Oizumi, and Moriyoshi Tamura, Yamaguchi-ken, Japan, assignors to Ube Industries, Ltd., Yamaguchi-ken, Japan

Filed Sept. 29, 1966, Ser. No. 582,865
Claims priority, application Japan, Oct. 1, 1965, 40/59,759
Int. Cl. C07c *63/28*
U.S. Cl. 260—515 4 Claims

Alkali metal salts of terephthalic acid are formed from salts of aromatic carboxylic acids by heating the raw materials in a reactor under controlled conditions of stirring and heat transfer so that the temperature distribution gradient from the heat transfer surface to the inner part of the reactor is initially high and is gradually lowered, whereby powdered or granular reaction products are recovered.

3,590,079

10',11'-DIHYDROSPIRO[CYCLOPROPANE - 1,5' - 5H-DIBENZO(a,d)CYCLOHEPTENE] - 2-CARBOXYLIC ACIDS

Carl Kaiser, Haddon Heights, and Charles L. Zirkle, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Oct. 19, 1965, Ser. No. 498,151, now Patent No. 3,423,461, dated Jan. 21, 1969. Divided and this application Aug. 23, 1968, Ser. No. 754,945
Int. Cl. C07c *63/44*
U.S. Cl. 260—515 6 Claims

10',11'-dihydrospiro[cyclopropane - 1,5' - 5H - dibenzo(a,d)cycloheptene] - 2 - carboxylic acids wherein the dibenzocycloheptene ring may be substitued by halogen, trifluoromethyl, lower alkyl, lower alkoxy or lower alkylthio are useful as intermediates for the preparation of corresponding 2-amino derivatives. The latter have antidepressant activity. The acids are generally prepared from appropriate dibenzo[a,d]cyclohepten-5-ones by conversion to the 5-methyl-5-ol, dehydration to the 5-methylene derivative, reaction with ethyl diazoacetate and hydrolysis of the resulting ethyl 2-carboxylate.

3,590,080

MANUFACTURE OF ω-HYDROXY ACIDS

Stanley Beesley and Victor Francis George Cooke, Duffield, Derby, England, assignors to Courtaulds Limited, London, England

Filed Oct. 17, 1966, Ser. No. 587,310
Claims priority, application Great Britain, Oct. 20, 1965, 44,364/65; Nov. 22, 1965, 49,538/65; Mar. 4, 1966, 9,507/66; Apr. 22, 1966, 17,659/66
Int. Cl. C07c *59/04*
U.S. Cl. 260—535 7 Claims

The process for making ω-hydroxy carboxylic acids by the peroxide oxidation of cyclic ketones using a solution of free polybasic acid catalysts.

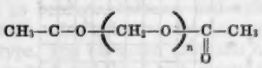
3,590,081

PROCESS FOR THE PREPARATION AND RECOVERY OF ACETIC ANHYDRIDE

Shinichi Ishida, Kunio Sato, Toshiaki Yamazaki, and Noboru Ohshima, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 12, 1967, Ser. No. 652,972
Claims priority, application Japan, July 21, 1966, 41/47,326
Int. Cl. C07c *51/56*
U.S. Cl. 260—549 6 Claims

A process for preparing acetic anhydride and aldehydes by thermal decomposing methylene glycol diacetate, or polymethylene glycol diacetate in a vapour phase at a temperature of 200°–600° C. in the presence of a solid catalyst. The diacetate is represented by the general formula



where *n* is an integer of 1–100. Typical catalyst is a mixture of alumina or silica gel and alkali metal halides.

The decomposition is preferably carried out in an inert organic medium having a boiling point of −20°–130° C. Examples of the medium are n-hexane and petroleum ether.

3,590,082

4-(p-FLUOROPHENYL)SALICYLAMIDE DERIVATIVES

Lewis H. Sarett, Princeton, and William V. Ruyle, Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Oct. 6, 1967, Ser. No. 673,270
Int. Cl. C07c *103/30*
U.S. Cl. 260—559 2 Claims

New fluorophenyl benzoic acid compounds particularly 5-(4'-fluorophenyl)-2-substituted benzoic acid derivatives and process for their preparation are claimed. The new fluorophenyl benzoic acid compounds described have anti-inflammatory, anti-pyretic and analgesic activity.

3,590,083

ALKYLTHIOALKANOYLAMINOPHENOL ANTIOXIDANTS

Martin Dexter, Briarcliff Manor, and Martin Knell, Ossining, N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Feb. 28, 1969, Ser. No. 803,456
Int. Cl. C07c *103/33*
U.S. Cl. 260—562 4 Claims

Novel alkylthioalkanoylaminophenol compounds are provided by a procedure involving the reaction of an alkylaminophenol and an alkylthioalkanoyl chloride. The alkylthioalkanoylaminophenols are useful as stabilizers of organic materials which are subject to oxidative deterioration.

3,590,084

1-(ALKYNYLPHENOXY)-2-HYDROXY-3-AMINOPROPANES AND THE SALTS THEREOF

Hendrik Adriaan Peperkamp, Van Houtenlaan, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Jan. 4, 1967, Ser. No. 607,167
Claims priority, application Netherlands, Jan. 7, 1966, 6600177
Int. Cl. C07c *93/06*
U.S. Cl. 260—570.7 4 Claims

Phenoxy-2-hydroxy-aminopropanes substituted in the ring by an unsaturated alkyl moiety. The moiety may be for example 2-propenyl or 2-vinyl. Specific examples are 1-(2-propenylphenoxy)-2-hydroxy-3-t. butylaminopropane and 1-{2-(butene-1-yl-1)phenoxy}-2-hydroxy-3-t. butylaminopropane. The compounds have β-adrenergic blocking properties and are useful in treating tachycardia.

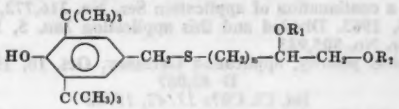
3,590,085

3,5-DI-t-BUTYL - 4 - HYDROXYBENZYLTHIO-2,3-DIHYDROXYPROPANE AND THE METHYL AND ETHYL ETHERS THEREOF

Harry Braus, Springdale, and Jay R. Woltermann, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Original application Apr. 7, 1967, Ser. No. 629,112. Divided and this application July 22, 1969, Ser. No. 851,536
Int. Cl. C07c *149/36*; C08f *45/54*
U.S. Cl. 260—609 2 Claims

Organic materials can be stabilized with a compound having the formula



n is a positive integer ranging from 1 to 4; and R_1 and R_2 may be the same or different and each is selected from the group consisting of H, an alkyl radical having from 1 to 22 carbon atoms, and

wherein R_3 is an alkyl radical having from 1 to 22 carbon atoms such as 3,5-di-t-butyl-4-hydroxybenzylthio-2,3-propanediol.

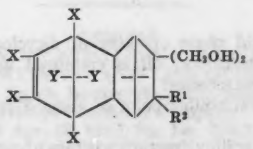
3,590,086

HALOGENATED 1,4,5,8-DIMETHANONAPHTHALENE-2,2-DIMETHANOLS

Jerome A. Gourse, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Oct. 14, 1968, Ser. No. 767,490
Int. Cl. C07c *35/22*
U.S. Cl. 260—617 7 Claims

This invention discloses new chemical compositions of matter and more particularly new compounds of the general formula



wherein X is selected from the group consisting of chlorine, fluorine and bromine; Y is selected from the group consisting of hydrogen, chlorine, fluorine and bromine; and R^1 and R^2 are selected from the group consisting of

hydrogen and alkyl. These compounds are useful as intermediates for the preparation of a variety of synthetic resins and plastics exhibiting flame and fire retardant properties.

3,590,087

TRANS-ANNULAR SEC-PHOSPHINE IN COMPLEX COMBINATION WITH COBALT AND CARBON MONOXIDE AS A CATALYST IN THE OXO ALCOHOL PROCESS

John L. Van Winkle, San Lorenzo, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Feb. 28, 1968, Ser. No. 708,788
Int. Cl. C07c *31/02*
U.S. Cl. 260—632 6 Claims

The novel transannular sec-phosphine, hydrocarbyl(octahydropentalyl-1-)phosphine is used in the selectively direct, single-stage production of reaction products consisting predominantly of primary alcohols by reacting an olefinic compound with carbon monoxide and hydrogen at a temperature between about 100° and 300° C. and superatmospheric pressure in the presence of a catalyst of cobalt in complex combination with carbon monoxide and hydrocarbyl(octahydropentalyl-1-)phosphine.

3,590,088

STABILIZATION OF 1,1,1-TRICHLOROETHANE

Hermann Richtzenhain, Cologne-Suelz, and Rudolf Stephan, Ranzel uber Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Patentabteilung, Troisdorf, Bezirk, Cologne, Germany

No Drawing. Application Jan. 16, 1967, Ser. No. 609,681, now Patent No. 3,445,532, dated May 20, 1969, which is a continuation of application Ser. No. 316,772, Oct. 16, 1963. Divided and this application Jan. 5, 1969, Ser. No. 805,923
Claims priority, application Germany, Oct. 18, 1962, D 40,087
Int. Cl. C07c *17/42, 19/02*
U.S. Cl. 260—652.5 1 Claim

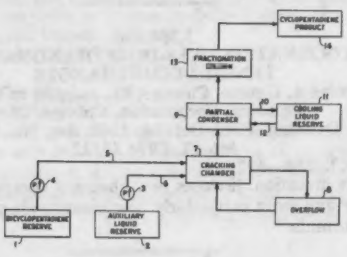
1,1,1-trichloroethane is stabilized with a mixture comprising β-methoxypropionitrile and 1,4-dioxane.

3,590,089

CRACKING DICYCLOPENTADIENE TO MONOMER

Stephen Robota, North Tonawanda, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 15, 1968, Ser. No. 767,761
Int. Cl. C07c *3/26*
U.S. Cl. 260—666 6 Claims



In the liquid phase cracking of dicyclopentadiene, a paraffinic hydrocarbon oil is employed which has the following characteristics:

(a) an initial boiling point of about 270° C. to about 277° C.

(b) a low boiling fraction wherein about 10 to about 20% to the oil will boil off when the temperature is about 295° to about 310° C.

(c) a wide boiling fraction wherein about 75% to about 85% of the oil boils off when the temperature is about 337° to about 357° C.

3,590,090

DEHYDROGENATION OF ORGANIC COMPOUNDS

Abraham D. Cohen, Israel S. Pasternak, and Noel J. Gaspar, Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company

No Drawing. Filed Dec. 2, 1968, Ser. No. 780,604
Int. Cl. C07c *15/10, 5/20*
U.S. Cl. 260—669 17 Claims

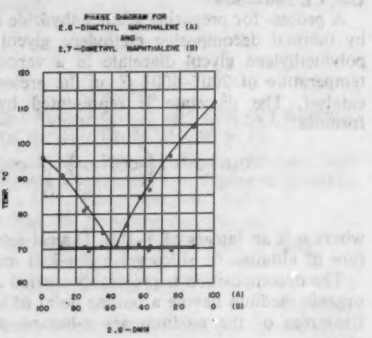
Organic compounds having a dehydrogenatable carbon-carbon bond are dehydrogenated in the vapor phase by contact with a sulfur oxide and oxygen, the oxygen being present in an amount insufficient to cause substantial burning of the organic compound, the dehydrogenation being preferably carried out in the presence of a low surface area catalyst and an inert diluent.

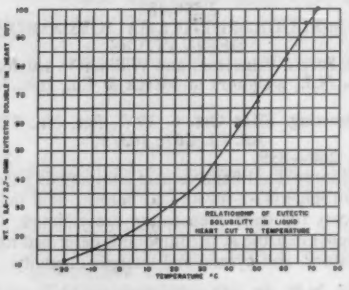
3,590,091

CRYSTALLIZATION AND PURIFICATION OF 2,6-DMN

Thomas E. Skarada, Upper Providence Township, Delaware County, Pa., and John A. Hedge, Wilmington, Del., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Aug. 16, 1968, Ser. No. 753,176
Int. Cl. C07c *7/14*
U.S. Cl. 260—674 7 Claims





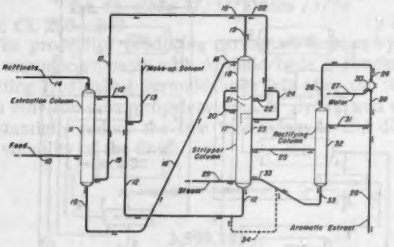
2,6-dimethylnaphthalene (DMN) can be recovered in high yields and high purity by carefully controlling the temperature of crystallization at the temperature determined from FIG. 2 at which all 2,6-/2,7-DMN eutectic is soluble in the liquids present. For example, a 495–510° F. catalytic gas oil distillate fraction containing

	Wt. percent
2,6-DMN	25
2,7-DMN	28
Other	47

will have a eutectic of 2,6-/2,7-DMN in the wt. ratio of .725/1 thus the eutectic represents 48.3% of incoming feed. To use FIG. 2, the wt. percent of eutectic is calculated on total feed, excluding free 2,6-DMN, in this case

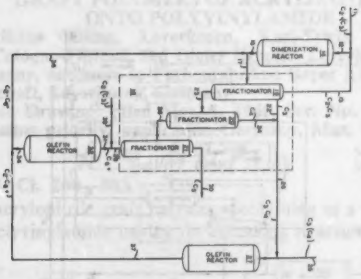
50.6 wt. percent eutectic. From FIG. 2, 50.6 eutectic is soluble at 37° C. The temperature of crystallization should be no less than 37° C. (±2° C.) to avoid crystallization of the 2,6-/2,7-eutectic and no more than 37° C. (±2° C.) to avoid dissolving free 2,6-DMN.

3,590,092
METHOD FOR AROMATIC HYDROCARBON RECOVERY
Kenneth D. Uitti, Bensenville, and Pedro Regina, Buffalo Grove, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Sept. 11, 1968, Ser. No. 759,103
Int. Cl. C07c 7/10; C10g 21/28
U.S. Cl. 260—674SE **5 Claims**



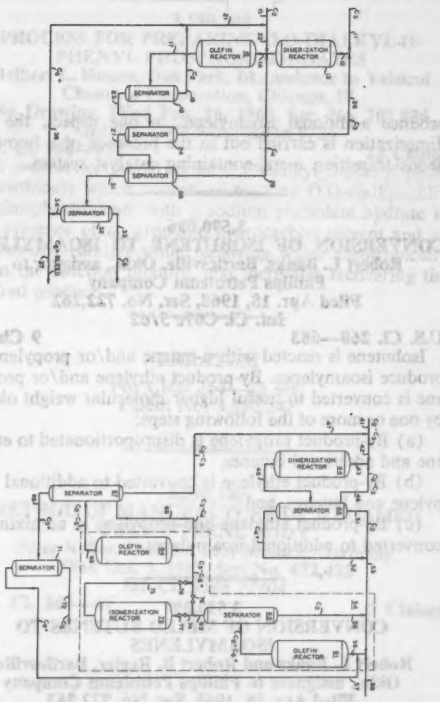
Method for extracting and recovering aromatic hydrocarbons, such as benzene, toluene, and xylene, from a suitable feedstock using selective solvent, preferably, of the sulfolane type. The extracted aromatic hydrocarbons are recovered in high yield and high purity using a combination of extractive distillation, aromatic side-cut rectification, and fractionation. The method is uniquely applicable for recovering benzene-type hydrocarbons in extremely high purity from catalytic reformates.

3,590,093
CONVERSION OF LOWER OLEFINS TO ISOAMYLENES
Donald L. Crain and Robert E. Reusser, both % Phillips Petroleum Co., Bartlesville, Okla. 74003
Filed Apr. 18, 1968, Ser. No. 722,260
Int. Cl. C07c 3/62
U.S. Cl. 260—683 **5 Claims**



Isoamylenes are produced from a feed stream comprising ethylene by codimerizing propylene and ethylene to produce isoamylene, feeding the effluent of the dimerization zone into a separation zone, feeding mixed butenes from the separation zone to an olefin reaction zone where they are reacted to produce additional isoamylenes, and feeding C_6 and heavier olefin hydrocarbons from the separation zone, along with ethylene or propylene, into an olefin reaction zone for production of lower molecular weight olefins which are recycled to the separation zone.

3,590,094
CONVERSION OF LINEAR ACYCLIC OLEFIN TO BRANCHED CHAIN OLEFIN
Robert E. Reusser and Donald L. Crain, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed Apr. 18, 1968, Ser. No. 722,259
Int. Cl. C07c 3/62
U.S. Cl. 260—683 **10 Claims**

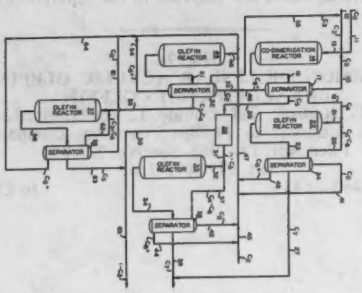


A linear acrylic olefin hydrocarbon is converted to produce an acrylic olefin hydrocarbon product by a combination of steps comprising dimerization followed by the olefin reaction with recycle of both heavier and lighter olefins to the olefin reaction zone.

3,590,095
CONVERSION OF ETHYLENE-PROPYLENE FEED TO ISOAMYLENES AND LINEAR OLEFINS
Ernest A. Zuech, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Apr. 18, 1968, Ser. No. 722,261
Int. Cl. C07c 3/62
U.S. Cl. 260—683 **7 Claims**

Ethylene and propylene are co-dimerized to produce linear butenes and pentenes and branched amylenes and hexenes, the linear butenes and pentenes are converted by the olefin reaction to longer chain linear olefins, the

C_6 and heavier olefins are converted by the olefin reaction to produce intermediate length branched chain olefins which are further reacted in an olefin reaction zone to



produce additional isoamylene. In one aspect, the codimerization is carried out in the presence of a homogeneous transition metal-containing catalyst system.

3,590,096
CONVERSION OF ISOBUTENE TO ISOAMYLENE
Robert L. Banks, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Apr. 18, 1968, Ser. No. 722,262
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 **9 Claims**

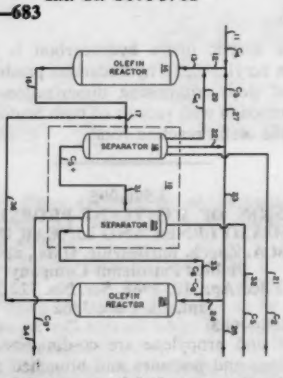
Isobutene is reacted with n-butene and/or propylene to produce isoamylenes. By-product ethylene and/or propylene is converted to useful higher molecular weight olefins by one or more of the following steps:

(a) By-product propylene is disproportionated to ethylene and additional butenes,

(b) By-product ethylene is converted to additional propylene and butenes, and

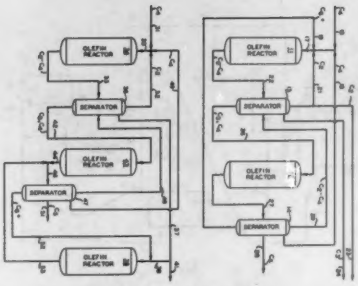
(c) By-product ethylene and propylene in admixture is converted to additional isoamylenes.

3,590,097
CONVERSION OF MIXED BUTENES TO ISOAMYLENES
Robert L. Banks and Robert B. Regier, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed Apr. 18, 1968, Ser. No. 722,263
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 **3 Claims**



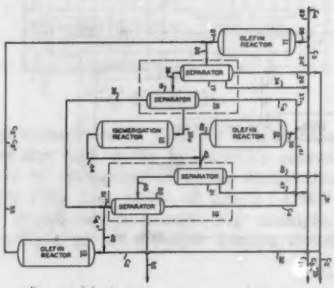
Mixed normal butenes and isobutene are converted to produce isoamylene by a first olefin reaction to produce isoamylenes and a heavier branched olefin, and the heavier branched olefin is converted, together with propylene, in a second olefin reaction zone to produce additional isoamylenes.

3,590,098
CONVERSION OF MIXED BUTENES TO ISOAMYLENES
Robert L. Banks, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Apr. 18, 1968, Ser. No. 722,264
Int. Cl. C07c *3/62*
U.S. Cl. 260—683D **9 Claims**



Isoamylene is produced from a stream comprising normal and isobutene by reacting the mixed butenes in an olefin reaction zone in the presence of ethylene followed by reacting resulting isobutene and propylene in a second olefin reaction zone.

3,590,099
CONVERSION OF MIXED BUTENES TO ISOAMYLENES
Robert L. Banks, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Apr. 18, 1968, Ser. No. 722,398
Int. Cl. C07c *3/62*
U.S. Cl. 260—683D **4 Claims**



A mixed butenes feed stream containing n-butene as well as isobutene is efficiently converted to isoamylenes

by reacting the butenes together with propylene to produce mixed amylenes, skeletally isomerizing the mixed amylenes, converting mixed butenes from the first conversion in a second conversion to produce additional mixed amylenes, reacting produced ethylene and C_8 and heavier hydrocarbons to produce additional quantities of C_3 to C_5 hydrocarbons, and producing a mixed amylene stream.

3,590,100

METHODS OF PRODUCING AND APPLYING TEXTILE FINISHES AND FINISHES PRODUCED BY SUCH METHODS

Herman G. Weiland, Westfield, N.J., assignor to Arkansas Company, Inc., Newark, N.J.

No Drawing. Filed Jan. 24, 1967, Ser. No. 611,268
Int. Cl. C08g *37/32*; D06m *13/34*
U.S. Cl. 260—849 **3 Claims**

The process of producing carbamate finishes by reacting amonocarbamate with formaldehyde is continued by reacting free excess formaldehyde left after the reaction with ethylene urea, propylene urea or glyoxal and urea to substantially reduce the free formaldehyde and diminish the volatility of the finish.

3,590,101

PROCESS FOR RECOVERING SUSPENSION POLYMERS

Robert B. McTaggart, Springfield, and Tevis Shusman, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Jan. 18, 1967, Ser. No. 610,032
Int. Cl. C08f *41/12*
U.S. Cl. 260—876R **9 Claims**

There is disclosed a process for recovering beads of polymer produced by suspension polymerization from an aqueous slurry of the beads wherein there is added to the slurry 0.01 to 1.2 percent by weight, based upon the weight of the polymer, of a polyethylene glycol having a molecular weight of about 200 to 6000. The aqueous medium is then removed, generally by centrifuging, and the beads are washed with water and dried. As a result of this process, the beads are substantially free from static charge so as to facilitate handling and retain upon their surface a minor amount of the polyalkylene glycol which imparts significant benefits in subsequent handling and processing.

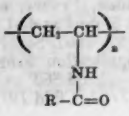
3,590,102

GRAFT POLYMERS OF ACRYLONITRILE ONTO POLYVINYLAMIDE

Carlhans Süling, Leverkusen, Karl-Erwin Schnalke, Cologne-Flittard, and Dieter Kramer, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 1, 1968, Ser. No. 709,820
Claims priority, application Germany, Mar. 11, 1967, F 51,798
Int. Cl. C08f *15/22*
U.S. Cl. 260—883 **4 Claims**

Acrylonitrile graft polymers containing as a graft basis a polyvinylamide having the recurring structural unit



wherein R represents a lower alkyl radical and *n* is a whole number from 3 to 300, and grafted thereon a vinyl monomer composition, consisting of at least 85% by weight of acrylonitrile and optionally an additional copolymerisable vinyl monomer.

3,590,103

DIALKYL OR ALKYL ALKYLOXYALKYL-1-SUBSTITUTED VINYL PHOSPHATES

Charles H. Tieman and Glenn E. Pollard, Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Apr. 25, 1968, Ser. No. 724,241
Int. Cl. C07c *153/07*; C07f *9/08*; A01n *9/36*
U.S. Cl. 260—941 **7 Claims**

Certain novel dialkyl iso-enol phosphates, primarily useful as intermediates for the preparation of pesticidal dialkyl enol phosphates.

3,590,104

PROCESS FOR PREPARING O,O-DIALKYL-O-PHENYL PHOSPHOROTHIOATES

Delbert L. Hanna, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Feb. 26, 1968, Ser. No. 707,936
Int. Cl. C07f *9/12*; A01n *9/36*
U.S. Cl. 260—973 **12 Claims**

A process for preparing an O,O-dialkyl-O-phenyl-phosphorothioate which comprises reacting O,O-dialkyl-chloro-phosphorothioate with a sodium phenolate hydrate in the presence of an aromatic hydrocarbon solvent and an alkylamine catalyst while removing water azeotropically from the reaction mixture, and thereafter recovering the desired product.

ERRATUM

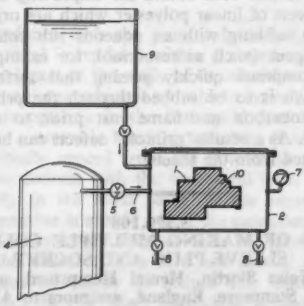
For Class 264—25 see:
Patent No. 3,590,242

3,590,105

METHOD OF MANUFACTURE OF A FOAMED POLYSTYRENE BODY

Peter Keller, Dachau, near Munich, Germany

Filed Oct. 3, 1967, Ser. No. 672,432
Int. Cl. B29d *27/04*
U.S. Cl. 264—48 **2 Claims**



A method of the manufacture of a foamed polystyrene body having a hard surface which comprises the steps of placing polystyrene containing a foaming agent in a mold, then feeding steam at a pressure of 5 to 10 atmospheres into the mold until a pressure of 2 to 5 at-

mospheres is obtained therein. The pressure is then reduced in the mold immediately to less than 1.5 atmospheres and then kept at this value for approximately 30 to 120 seconds.

3,590,106

PROCESS FOR PROVIDING POLYAMIDE FIBERS OF RELATIVELY LOW SOIL RETENTIVENESS

Andrew I. Smith, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 568,769, July 29, 1966. This application Sept. 22, 1969, Ser. No. 860,055

Int. Cl. B29g *5/00*; B29c *25/00*

U.S. Cl. 264—136 3 Claims

Polyamide fibers of relatively low soil retentiveness are provided by drawing the fibers while coated with a liquid substance selected from the group consisting of glycerol, at least one C_2–C_6 alkylene glycol, at least one poly(C_2–C_4 alkylene glycol) having a molecular weight between 106 and about 600 and mixtures thereof over a drawing surface heated to a temperature between 130° and 220° C.

3,590,107

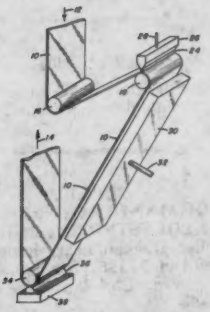
METHOD OF FLAME TREATING SUBBED SHEETS OF LINEAR POLYESTERS PRIOR TO ORIENTATION

Edward W. Smith, Jr., and Arthur W. Spencer, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 26, 1969, Ser. No. 836,911

Int. Cl. B44d *1/092*

U.S. Cl. 264—80 6 Claims



A method has been found for improving the appearance of sheets of linear polyester which are oriented subsequent to subbing with an aqueous sub containing an "attack" agent (such as resorcinol, for example) which method comprises quickly passing that surface of the sheets which is to be subbed through the primary cone of a hydrocarbon gas flame just prior to application of the sum. As a result, "printoff" defects can be practically eliminated from the sheets.

3,590,108

METHOD OF MAKING MULTIPLE COLD CRIMP SLEEVE PLUG AND SOCKET

Kenneth John Startin, Hemel Hempstead, and Kamal Ahmed, Stanmore, England, assignors to AMP Incorporated, Harrisburg, Pa.

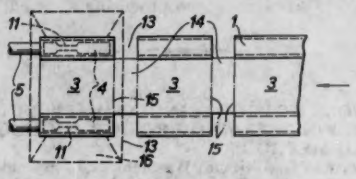
Filed Sept. 24, 1968, Ser. No. 762,068

Claims priority, application Great Britain, Oct. 3, 1967, 44,966/67

Int. Cl. B29c *17/14*; B29d *3/00*

U.S. Cl. 264—150 8 Claims

A method of forming plug or socket multiple connectors by the cold crimp sleeve technique involves the use of a twin sleeve extrusion, the sleeves being joined by a web, portions of the sleeves being cut out at intervals around web portions which serve as a carrier strip. Such an extrusion can then be fed conveniently to the dual die of a crimping machine where terminals of a twin core lead are inserted into respective sleeves. On crimping, both



sleeves are simultaneously cold formed about respective terminals, and the carrier strip portion is severed. To facilitate use, a portion of the web between the sleeves may also be cut away to allow penetration of one multiple connector into the sleeves of another multiple connector.

3,590,109

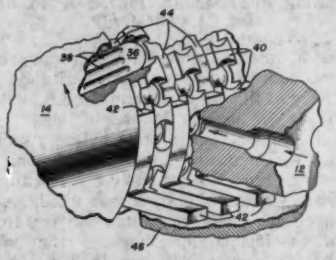
CONTINUOUS MOLDING OF THERMOPLASTIC MATERIALS

Jack Doleman, Gulf Breeze, Fla., and William H. Hills, Durham, N.C., assignors to Monsanto Company, St. Louis, Mo.

Original application July 3, 1967, Ser. No. 650,986, now Patent No. 3,507,010, dated Apr. 21, 1970. Divided and this application Sept. 12, 1969, Ser. No. 857,462

Int. Cl. B29f *1/06*

U.S. Cl. 264—167 18 Claims



Three-dimensional molded products are made from thermoplastic materials in a continuous injection molding process wherein a mold surface having deep cavities therein is advanced with respect to a stationary extruder mated against the mold surface so that communication exists between the cavities and the extruder causing a flowable thermoplastic material to be forced into said cavities under high pressure by isolating the cavities from the remainder of the mold. On the mold surface a continuous matrix is formed having projections attached thereto and extending into the cavities of the mold. The matrix is formed under a lower pressure than the projections. After cooling, the product is stripped from the mold.

3,590,110

PROCESS FOR THE PRODUCTION OF SOLIDIFIED TRIOXAN

Pierre Decitre, Bethune, France, assignor to Houilleres du Bassin du Nord & du Pas-de-Calais, Nord, France

Filed Oct. 17, 1967, Ser. No. 675,835

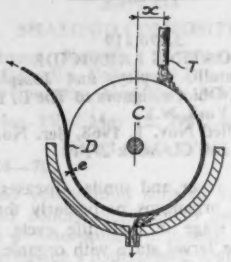
Claims priority, application France, Oct. 19, 1966, 80,563

Int. Cl. B29d *7/02*; C07d *19/00*; C08g *1/04*

U.S. Cl. 264—212 5 Claims

Processes for producing solid trioxan in the form of oriented crystals which comprise continuously applying liquid trioxan at a temperature of 62° to 70° C. onto a

cooling surface maintained at a temperature of 10° to 55° C. to solidify the trioxan and continuously removing the solidified trioxan, the surface being moved relative to the



point of application of the liquid trioxan so that the trioxan which has solidified on the surface is not in contact with a considerable excess of hot liquid trioxan.

3,590,111

METHOD OF PRODUCING LIGHTWEIGHT SHAPED ARTICLES CONTAINING PERLITE OR VERMICULITE

Istvan Gebefügi, 73 Goldbrunnenstrasse, 8055 Zurich, Switzerland

Filed Dec. 12, 1967, Ser. No. 689,892
Claims priority, application Germany, Dec. 16, 1966, G 48,756
Int. Cl. B29c *25/00*; C04b *31/00*
U.S. Cl. 264—234 **5 Claims**

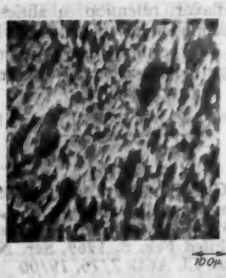
Shaped articles for construction or insulation comprising expanded perlite, vermiculite or a mixture thereof, compounded by a quasi-colloidal binding agent made up from perlite dust and containing mixed crystals of calcium silicate hydrate, calcium aluminosilicate hydrate, and calcium aluminate hydrate produced by the reaction of calcium oxide or dry hydrated calcium oxide with finely divided perlite, the shaped article containing 15 to 40% by weight of the binder based on the solids content thereof. The binder is also useful for making other products, for instance, laminates which have a core sheet of the shaped article and one or more cover sheets of plastic, paper, or other desired material. The invention also comprises a method of making the binder and the shaped articles.

3,590,112

TREATMENT OF MICROPOROUS ELASTOMERIC POLYURETHANE

Frank P. Civardi, Wayne, N.J., assignor to Inmont Corporation, New York, N.Y.

Filed Dec. 2, 1968, Ser. No. 780,477
Int. Cl. B29c *25/00*; B29d *27/00*
U.S. Cl. 264—321 **6 Claims**



Process for improving the properties of water vapor permeable microporous sheet of non-fibrous thermoplastic elastomeric polyurethane of thickness suitable for use as a substitute for shoe upper leather. The sheet is heat treated at a temperature below its collapse temperature so that it shrinks at least 5% in area.

3,590,113

PROCESS FOR THE PRODUCTION OF CONICAL HOLLOW ARTICLES OF REINFORCED SYNTHETIC RESINS

Heinrich Pichler, Mayrwies 155, Salzburg, Austria

No Drawing. Filed Aug. 23, 1968, Ser. No. 754,976
Claims priority, application Austria, Aug. 25, 1967, A 7,819/67
Int. Cl. B29c *1/04*; B29g *1/00*
U.S. Cl. 264—327 **7 Claims**

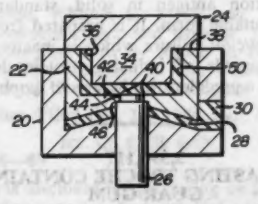
A process for the production of conical articles comprises interposing a resin mixture between two conical molds that are nested one in the other. The inner mold is precooled and the outer mold is preheated prior to the interposition of the resin therebetween. The resin is then allowed to be partially cured into a soft yet solid state. The inner mold is then removed, the resin being maintained in the outer mold so that it is fully cured into a hardened solid article. The outer mold is then cooled to permit withdrawal of the article therefrom.

3,590,114

DISPLACEMENT MOLDING OF PLASTIC ARTICLES

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Oct. 30, 1967, Ser. No. 679,109
Int. Cl. B29f *1/04*
U.S. Cl. 264—328 **7 Claims**



In accordance with the present invention, plasticized plastic material is confined within a chamber of variable volume, and part of the walls of the chamber are formed by a first mold part which is movable relative to the chamber. A gate opening in the first mold part is normally blocked by a movable blocking member. A second mold part is initially spaced from the first mold part and is moved into contact with the first mold part. There is a mold cavity in the mold parts. At the same time, the blocking member is moved out of the gate opening so that the mold cavity communicates with the plasticized material in the chamber. The first and second mold parts are then moved jointly to reduce the volume of the chamber and thereby inject plasticized material through the gate opening into the mold cavity. Next, the gate opening is closed by the blocking member. The mold parts and the blocking member are moved in the reverse direction to enlarge the chamber to its original volume, and then the first mold part and the blocking member are halted while the second mold part moves further in the reverse direction to its initial position to accommodate ejection of the molded article. In one embodiment, the

second mold part includes two members defining the mold cavity, these members being separable to effect ejection of the molded article.

3,590,115

RADIOLOGICAL MIXTURE AND METHOD OF PREPARING THE GASTRO-INTESTINAL SYSTEM FOR X-RAY PHOTOGRAPHY

Richard E. Ericson, Keene, N.H., assignor to Elliot Laboratories, Inc., Fitzwilliam, N.H.

No Drawing. Filed Oct. 17, 1968, Ser. No. 768,552
Int. Cl. A61k *27/08*
U.S. Cl. 424—4 3 Claims

A dry, solid radiopaque mixture suitable for the preparation of an enema therefrom by adding a liquid thereto comprising a water dispersible contrast media in a dry state and a water soluble, solid, particulate, polar coating agent having the property of increasing the coatability of the contrast medium on the wall of the intestine, preferably a water soluble soap, the coating agent being present in an amount equal to about .03 to 4% by weight of the contrast media in the mixture.

In a method of preparing the gastro-intestinal system for X-ray photography comprising administering an enema containing a dispersion of a contrast media and a soap solution in which the soap in solution is about .03 to 4% by weight of the contrast media in the dispersion.

3,590,116

ANTIGEN FOR HEMAGGLUTINATION INHIBITION TEST

Peter H. Matisheck and Thomas J. Langpap, Charles City, Iowa, assignors to Salsbury Laboratories

No Drawing. Filed Feb. 7, 1968, Ser. No. 703,553
Int. Cl. G01n *33/16*
U.S. Cl. 424—12 3 Claims

A diagnostic reagent for avian mycoplasmosis. The reagent is a non-infective, sensitive, and stable hemagglutination inhibition antigen in solid, standardized, and easily reconstitutable form. It is prepared from a *Mycoplasma gallisepticum* culture which is inactivated with a bactericide incapable of inducing protein denaturation, standardized to a predetermined titer and lyophilized.

3,590,117

LONG-LASTING TROCHE CONTAINING GUAR GUM

George L. Christenson, Cincinnati, and Harold E. Huber, Goshen, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Filed Mar. 24, 1969, Ser. No. 810,011
Int. Cl. A61j *3/06, 3/10;* A61k *27/12*
U.S. Cl. 424—19 1 Claim

A compressed powder, long-lasting, troche containing 3% to 6% of guar gum, 15% to 85% of dry skim milk powder and at least 9% of a water-soluble pharmaceutically acceptable tabletting diluent.

3,590,118

LONG LASTING INSECT REPELLENT FILMS FOR SKIN AND OTHER SUBSTRATES

James A. Conrady, Amherst, and Charles H. Stockman, Akron, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,513
Int. Cl. A61k *27/12*
U.S. Cl. 424—19 7 Claims

Active chemical agents dissolve in interpolymer resins of alpha-beta olefinically unsaturated carbonyl monomers. The solutions are found to be slow release systems for the chemical agents when spread and dried as films on substrates. Coatings can be applied by spraying or spreading and are easily removable with a mildly alkaline solution such as soapy water, but resist elements such as rain, snow, perspiration and the like.

3,590,119

FLOATING LARVICIDE

Nathan F. Cardarelli, Copley, and Joseph C. Hess, Cuyahoga Falls, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,807
Int. Cl. A61k *27/12*
U.S. Cl. 424—22 2 Claims

Malaria, yellow fever and similar diseases are spread by water-spawned organisms particularly those that go through a larval stage in their life cycle. Mosquitoes are attacked in the larval stage with organic phosphorothioate larvicides, chlorinated hydrocarbons, and addition products of ethylene oxide and aliphatic alcohols such as oleyl alcohol which kill larvae when spread upon an infested water supply. Direct dispersion of the toxicant or toxicant with known carriers onto the infested waters has very limited periods of effectiveness against the larvae and simultaneously pollutes the water. It is discovered that delayed toxicant release, much longer protection, and less water pollution result when certain toxicants are dissolved into a particular elastomeric matrix and then pellets or pieces of the resulting composition (preferably in vulcanized form) are dispersed upon the infested water. Ethylenepropylene-diene terpolymer rubbers known as EPDM rubbers are suitable elastomers for this purpose. When the elastomeric-toxicant compositions are in floating contact with infested water, a toxic substance is released slowly from the composition into the water at the water surface and the composition is capable of maintaining a toxic concentration to larvae for periods of months in stagnant water. The larvicidal elastomeric (or rubber) compositions contain an organic toxicant dissolved in a vulcanized EPDM rubber matrix specially compounded and cured in such a fashion that the toxicant remains soluble and sufficiently mobile in the matrix as to diffuse to the surface of the matrix at a selected, controlled rate and to be released therefrom into the water environment by molecular release at a rate adapted best to carry out the larvicidal application.

3,590,120

CHEWING GUM

Joseph C. Muhler, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

No Drawing. Filed Apr. 16, 1969, Ser. No. 816,773
Int. Cl. A61k *7/16, 9/02*
U.S. Cl. 424—48 10 Claims

An improved chewing gum comprising an insoluble chewing gum base has incorporated therein a dental plaque removal agent such as sodium bicarbonate ($NaHCO_4$) or the like. In addition, the chewing characteristics, the flavor retention qualities, the dental cleaning and polishing effectiveness of chewing gums may be improved by incorporating therein a dental cleaning and polishing agent comprising a mixture of fine and coarse zirconium silicate particles.

3,590,121

EFFERVESCENT DENTAL COMPOSITIONS

Thomas Schiff and Kenneth J. Shaver, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Feb. 5, 1969, Ser. No. 796,910
Int. Cl. A61k *7/16, 19/00*
U.S. Cl. 424—50 1 Claim

This invention relates to effervescent dental compositions containing enzymes, for example, an effervescent

dental tablet containing an enzyme mixture produced by *Bacillus subtilis*.

3,590,122

SHAMPOO COMPOSITION

Karl Hutcheson Roberts, Flemington, and Marion Anthony Gomolka, Colonia, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed May 12, 1967, Ser. No. 637,898

Int. Cl. A61k *7/06*

U.S. Cl. 424—70 **1 Claim**

A shampoo composition suitable for simultaneously cleansing and conditioning human hair, comprising in combination a water-soluble non-soap organic synthetic detergent salt having a hydrophobic long chain substituent containing at least 8 carbon atoms in its molecular structure and a normally liquid saturated branched-chain higher fatty acid material containing about 12–24 carbon atoms. Preferred compositions contain about 10–40% by weight of the detergent and 0.5 to 5.0% by weight of the fatty acid material in an aqueous medium.

3,590,123

HUMAN HAIR, SKIN AND NAIL TREATMENT WITH SULFOSUCCINATE COMPOSITIONS

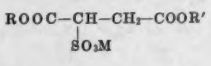
Wilhelm Melloh, Fulda, and Helmut Hoffmann, Steinau, Schluchtern, Germany, assignors to Rewo Chemische Fabrik G.m.b.H., Steinau, Kreis Schluchtern, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 403,930, Oct. 14, 1964. This application Mar. 9, 1967, Ser. No. 621,801

Int. Cl. A11k *7/06*

U.S. Cl. 424—70 **4 Claims**

Composition for treating skin, hair and the like, containing as the active ingredient a sulfosuccinate of the formula



In this formula R represents a radical of total wool fat alcohols and/or total wool fatty acid monoethanolamide; M represents Na, Mg, K, NH_4 or monoethanolamine, and R′ may be R, M and the methyl radical. The active ingredient adheres to skin and hair and the composition may be pharmaceutical or cosmetic.

3,590,124

BLOOD TRANSFUSION FLUIDS HAVING REDUCED TURBULENT FRICTION PROPERTIES

Jack W. Hoyt, Pasadena, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed June 27, 1967, Ser. No. 649,367

Int. Cl. A61k *27/00*

U.S. Cl. 424—78 **4 Claims**

To a blood transfusion fluid, such as blood plasma, blood volume extender, blood substitute, or the like, is added small concentrations of soluble high-polymer material characterized by a generally linear, long chain molecular structure and a molecular weight in excess of 100,000. The concentration of polymer is in the range of 5–100 parts per million by weight (w.p.p.m.).

3,590,125

PHYSIOLOGICAL SALT SOLUTIONS OF ETHYLENE OXIDE-POLYPROPYLENE GLYCOL CONDENSATION PRODUCTS AS BLOOD PLASMA SUBSTITUTES

Alan C. Hymes, Hopkins, Minn., assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich.

No Drawing. Continuation-in-part of application Ser. No. 670,453, Sept. 25, 1967. This application Oct. 10, 1969, Ser. No. 865,524

Int. Cl. A61k *27/00*

U.S. Cl. 424—78 **4 Claims**

Physiological salt solutions of certain ethylene oxide-polypropylene glycol condensation products have been found to be particularly effective as blood plasma substitutes. These solutions may be employed in the treatment of shock, in transfusion reactions, and as priming agents in the heart-lung apparatus.

3,590,126

CHITIN ANTIGENS AND METHOD

William R. Porter, 301 Piping Rock Drive, Colesville, Md.

Filed Apr. 2, 1968, Ser. No. 718,188

Int. Cl. A61k *23/02*

U.S. Cl. 424—88 **10 Claims**

The present invention provides chitin antigens and use thereof for treating warm-blooded animals normally subject to attack by parasitic members of the class Arachnida, typically ticks and mites.

3,590,127

PROCESS OF PRODUCING EQUINE VIRAL ARTERITIS VACCINE AND PRODUCT THEREOF

John T. Bryans, William H. McCollum, and James C. Wilson, Lexington, Ky., and Elvis R. Doll, deceased, late of Lexington, Ky., by Mable R. Doll, executrix, Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

No Drawing. Filed Oct. 14, 1968, Ser. No. 767,530

Int. Cl. C12k *9/00*

U.S. Cl. 424—89 **4 Claims**

A process is disclosed for producing an avirulent attenuated live virus vaccine for use in immunizing horses against equine viral arteritis and for simultaneously obviating the transmission of the disease from a vaccinated horse to a non-vaccinated horse. The invention also includes the product derived from practice of the process and typical examples of the efficacy of the product are disclosed.

3,590,128

ANIMAL VACCINES AND METHODS FOR USING SAME

Rene Norman Larose, Hartford, Conn., assignor to Arbor Acres Farm, Inc., Glastonbury, Conn.

No Drawing. Filed June 25, 1968, Ser. No. 739,622

Int. Cl. A61r *27/00*

U.S. Cl. 424—89 **24 Claims**

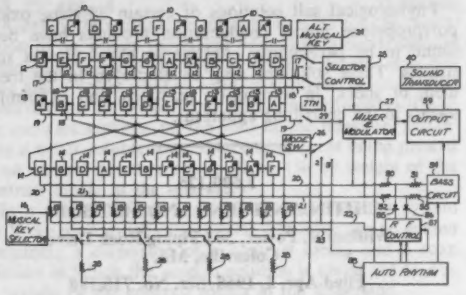
Vaccine for use in immunizing poultry against lymphoid leukosis and erythroblastosis comprising a live lymphoid leukosis erythroblastosis causative virus and avian cell tissue. Methods for immunizing poultry and for obtaining a lymphoid leukosis erythroblastosis virus from a lymphoid leukosis virus by serially passing through live birds.

ELECTRICAL

3,590,129
ELECTRONIC CHORD SELECTION DEVICE FOR A MUSICAL INSTRUMENT

Alfred B. Freeman, 20418 Seaboard Road, Malibu, Calif.

Filed Apr. 23, 1969, Ser. No. 818,724
Int. Cl. G10h *1/00, 5/00*
U.S. Cl. 84—1.01 12 Claims

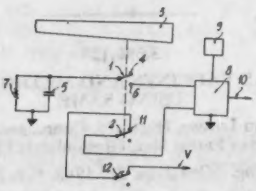


The 12 playing keys of an octave range on a standard keyboard each apply a set of chord tone signals to a chord modulator and the root and fifth parts also through input selection gates to a bass divider. Auxiliary controls or an automatic rhythm device drives the input selection gates to alternate the root and fifth parts in the bass and also drives the chord modulator and a bass keyer for various rhythmic patterns of chord and bass. A musical key selector picks any of six pairs of musical keys and controls the tone signals responsive to the playing keys so the chords produced are diatonic chords of the pair of selected musical keys. Other auxiliary controls allow the player to add or delete chord parts and to change the types of chords. Diode keyers feeding into current mixers allow multiple drives without introducing cross-talk and so minimize the number of keyers required.

3,590,130
ELECTRONIC MUSICAL INSTRUMENTS

Luciano Peli, Bologna, Italy, assignor to C. E. I. Controlli Elettronici Industrial R. L., Bologna, Italy

Filed Oct. 6, 1969, Ser. No. 864,570
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 2 Claims

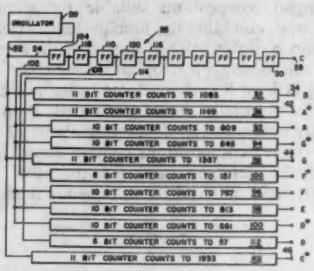


An electronic instrument for simulating the sound effect produced by a piano. The instrument comprises an electronic generator an electric signal of constant amplitude and electrical switching arrangement connected to the generator and adapted, upon operation of a key associated therewith, to cause the signal from the generator to be applied to an output of the instrument.

3,590,131
ELECTRONIC MUSICAL SCALE GENERATOR EMPLOYING A SINGLE MASTER OSCILLATOR

Robert R. Reyers, 709 Magnalia Ave., Absecon, N.J.

Filed Feb. 11, 1969, Ser. No. 798,347
Int. Cl. G10h *5/02, 5/10*
U.S. Cl. 84—1.03 11 Claims

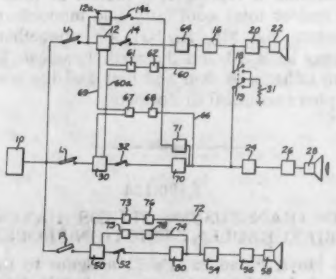

OSCILLATOR
11 BIT COUNTER COUNTS TO 1093
11 BIT COUNTER COUNTS TO 1149
10 BIT COUNTER COUNTS TO 609
10 BIT COUNTER COUNTS TO 646
11 BIT COUNTER COUNTS TO 1207
8 BIT COUNTER COUNTS TO 181
10 BIT COUNTER COUNTS TO 767
10 BIT COUNTER COUNTS TO 813
10 BIT COUNTER COUNTS TO 861
8 BIT COUNTER COUNTS TO 97
11 BIT COUNTER COUNTS TO 1933

For use in electronic organs and the like, an electronic circuit for generating 12 signals, the frequencies of which correspond to the notes of the musical scale, comprises a single, variable frequency oscillator which produces pulses at a high repetition rate. A counting network, driven by the oscillator pulses, produces 12 pulse trains, the frequencies of which are related to each other by $\sqrt[12]{2}$. The 12 pulse trains are filtered directly to produce musical notes, and are further reduced in frequency, and then filtered to produce lower octaves.

3,590,132
PRESET SYSTEM FOR ELECTRONIC ORGANS

John William Robinson, and Billy Joe Whittington, both of Jasper, Ind., assignors to Jasper Electronic Mfg. Cor., Jasper, Ind.

Filed Jan. 23, 1969, Ser. No. 793,308
Int. Cl. G10h *3.06*
U.S. Cl. 84—1.17 16 Claims



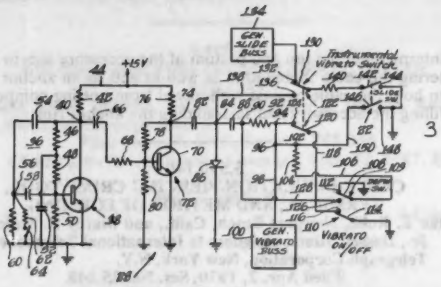
The invention concerns a system for cutting out the selected voices in electronic organs, while automatically cutting in anyone of a plurality of preselected voice combinations. An electronic system utilizing flip-flop circuits controls the energization of lamps which are operable to illuminate photocells, some of which are in series with the preselected voicing combinations and others of which are in series with the conventional selector tabs for the voicing circuits and still others are disposed between the conventional selector tabs and ground. By controlling the illumination of the photocells, the voicing circuits to which they are connected can be made selectively effective and ineffective.

3,590,133

VARIABLE AMPLITUDE VIBRATO AND GLISSANDO CIRCUITRY FOR ELECTRONIC MUSICAL INSTRUMENTS

Harold O. Schwartz, North Tonawanda, and Roger J. McNerney, Tonawanda, both of, N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed Nov. 15, 1968, Ser. No. 776,230
Int. Cl. G10h *1/02, 1/04*
U.S. Cl. 84—1.24 8 Claims



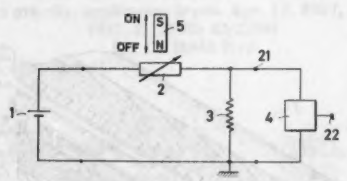
A vibrato oscillator on the order of 6 cycles per second frequency is supplied in an electronic organ. A diode shunts the output of the vibrato oscillator, and when the diode is conductive, no vibrato oscillations are provided to the organ oscillators and no vibrato appears in the organ output. A manually operable switch is provided which causes a capacitor to charge through the diode, gradually biasing the diode off and applying the vibrato signal at a controlled rate to the organ oscillators to produce an increasing vibrator in the organ output. Glissando circuitry is also provided but the vibrato and glissando cannot coexist.

3,590,134

ELECTRONIC MUSICAL SYSTEM WITH MAGNETIC FIELD RESPONSIVE SWITCH AND VOLUME CONTROL

Mikio Ogi, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi; Shizuoka-ken, Japan

Filed Mar. 24, 1969, Ser. No. 809,800
Claims priority, application Japan, Mar. 29, 1968, Mar. 29, 1968, 43/25029;43/25030
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.26 7 Claims



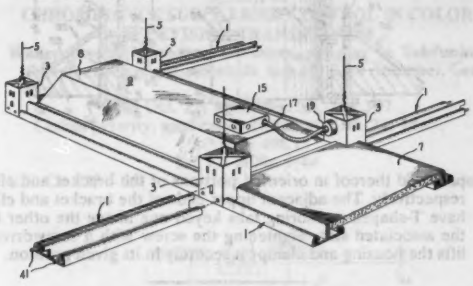
An electronic musical system has a DC power supply and a tone generator with a first resistance connected in series between them. A second resistance has one end connected to the series circuit between the power supply and the tone generator and the other end connected to ground. One of the resistances is a magnetoresistor the electric resistance of which varies in accordance with the intensity of the magnetic field applied thereto. A key is movably mounted above the magnetoresistor with a magnet element mounted thereon close to the magnetoresistor, so that movement of the key controls the electrical resistance of the magnetoresistor depending on the amount the key is moved, and thus controls the volume of the tone generator.

3,590,135

CEILING STRUCTURE WITH INTEGRAL POWER DISTRIBUTION MEANS

Joseph F. Herbenar, Edina, Minn., and Kenneth A. Lindgren, Cleveland, Ohio, assignors to General Electric Company

Filed July 24, 1969, Ser. No. 844,489
Int. Cl. H02g *3/26;* E04b *5/55*
U.S. Cl. 174—49 9 Claims



A ceiling of the suspension or "false-ceiling" type having a plurality of rectangular sheets carried in coplanar relation by a plurality of elongated flanged support members which also include electrical conductors for supplying power to lighting or other fixtures. The support members are arranged in a "-grid" and carry the fixtures in addition to providing a simple and flexible electric connection.

3,590,136

HOUSING FOR ENCLOSING INSTRUMENTS AND THE LIKE TO BE MOUNTED ON INSTRUMENT PANEL OF AUTOMOBILE

Takeshi Kunishi, Kariya-shi; Yoshihiro Kawade, Kariya-shi; Koiti Yamakita, Ama-gun, Aichi-ken; Ryozo Takani, Hekikai-gun, Aichi-ken, and Katuhiro Yamanaka, Hekinan-shi, all of, Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Dec. 2, 1969, Ser. No. 881,373
Claims priority, application Japan, Dec. 17, 1968, 92904
Int. Cl. H05k *5/00*
U.S. Cl. 174—50 6 Claims

A housing for enclosing instruments such as meters, a radio, gages, control units for an air-conditioning system, etc. and the like to be mounted on a front instrument panel of an automobile, in the partitioned chambers molded together with said housing made of a synthetic resin. The housing is provided with electric conductors embedded therein for electrical connections of said instruments and the like with their corresponding exterior instruments, machines and the like.

3,590,137

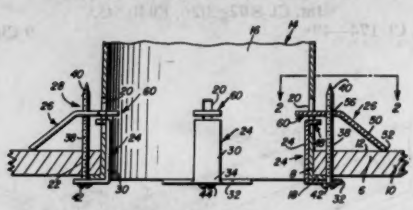
ELECTRIC FIXTURE HOUSING FASTENING DEVICE

Anthony N. Librandi, 12 Thompson St., Larchmont, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,026
Int. Cl. H02g *3/12*
U.S. Cl. 174—58 9 Claims

A fastening device for an open-bottom recessed electric fixture housing equipped with circumferentially spaced mounting slots and a ceiling abutting flange or rim. Each

fastening device comprises (1) a one piece adapter bracket (2) a complemental clip, and (3) a screw-threaded headed fastener which is adapted to be passed through a bolt hole in the ceiling and screwed into coacting screw-threaded holes

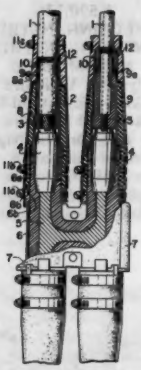


provided thereof in oriented portions of the bracket and clip respectively. The adjacent upper ends of the bracket and clip have T-shaped anchoring tabs keyed one above the other in the associated slot. Tightening the screw with a screwdriver lifts the housing and clamps it securely in its given position.

3,590,138
CABLE BRANCH JOINT

Yoichi Sugimoto, 625 Domyoji, Fujidera, Osaka; Shizuhiro Nakata, No. 1043-34, Kujo-cho, Yamotokoriyama, Nara, and Sozo Idomoto, 53-1, Takakura-cho, 2-chome, Miyakojim-ku, Osaka, all of, Japan

Filed July 31, 1969, Ser. No. 846,540
Int. Cl. H02g *15/08*
U.S. Cl. 174—72 **2 Claims**



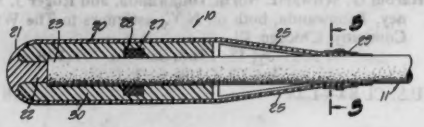
A cable branching joint of molded insulation having a built-in conductor, which joint is made by molding synthetic rubber or plastic to the outer circumferences of the conductor, inserting cable conductors into the terminals of this molded insulation and covering them with an insertion-type insulation formed of an elastic insulating material like synthetic rubber, which is attachable and detachable and is applicable irrespective of the cable size and the number of branch terminals.

3,590,139
CABLE CAPPING ACCESSORY

George W. Gillemot, 2331 20th St., Santa Monica, Calif., and John T. Thompson, 244 Loring St., Los Angeles, Calif.

Filed Dec. 15, 1969, Ser. No. 885,243
Int. Cl. H02g *15/04*
U.S. Cl. 174—76 **8 Claims**

A capping accessory for hermetically sealing a cable end temporarily or permanently. The accessory is typically molded in one piece from a thermoplastic material sealable to potting compound and preferably includes a locator boss within its inner end as well as a plurality of flexible tangs projecting axially from its open end with their free ends securable to the adjacent surface of a cable assembled into the accessory. Adhesive tape wrapped about the cable in an area

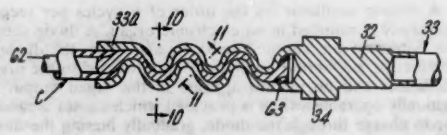


intermediate the top and bottom of the accessory aids in centering the cable therewithin as well as acts as an anchor ring to hold the cable against withdrawal from potting compound filling the accessory and surrounding the anchor ring.

3,590,140
CABLE-INSULATION-PIERCING CRIMP TOOL, TERMINAL, AND METHOD OF FORMING

Ian E. Robb, Newport Beach, Calif., and Marcy R. Malcolm, Jr., Dassel, Minn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,148
Int. Cl. H02g *15/08*
U.S. Cl. 174—84 C **3 Claims**

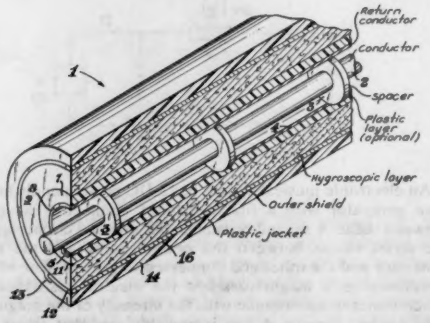


An insulated conductor sinuously crimped in a hollow tubular section of a terminal. Crimped indentations of the tubular section are disposed on diametrically opposite sides thereof and axially offset. The sides of the section at the indentations are in electrical contact with the conductor. The insulation is dislodged at the areas of contact and disposed in regions of the tubular section where contact does not occur.

3,590,141
ELECTRIC CABLE HAVING IMPROVED RESISTANCE TO MOISTURE

Raymond C. Mildner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1969, Ser. No. 799,674
Int. Cl. H01b *7/28*
U.S. Cl. 174—105 **18 Claims**



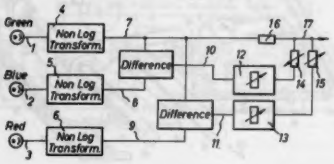
An electric cable having a cylindrical protective metal shield formed by overlapping the edges of a metal strip to form a longitudinal seam and an outer plastic jacket is

rendered resistant to moisture by means of a sheath in the form of a layer of a hygroscopic material such as paper or a blend of a polymer and a siccative drying agent and a metal shield surrounding the layer of hygroscopic material and having the edges thereof in overlapping relationship to form a longitudinal seam bonded together by means of an adhesive polymer. The sheath is disposed within the cable between the protective metal shield and the outer plastic jacket such that the layer of hygroscopic material is in contact with the protective metal shield and the metal shield of the sheath is in contact with the outer plastic jacket.

3,590,142
METHOD FOR ELECTRONIC CORRECTION OF COLORS

Hans Keller, Molfsee, Germany, assignor to Dr.-Inq. Rudolf Hell Kommanditgesellschaft

Filed Mar. 21, 1968, Ser. No. 715,040
Claims priority, application Germany, Mar. 22, 1967, H 62217
Int. Cl. H04n 9/12
U.S. Cl. 178—5.2 **2 Claims**

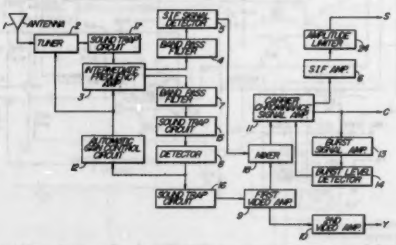


A method of producing colored reproductions of colored originals, utilizing electronic color correction, in which a secondary correction signal which disappears for gray tones is formed from the uncorrected color separation signals and another signal of the same gray contrast containing color correction information, by formation of the difference, in which the primary color separation signals concerned, proportional to the transparency, are transformed according to a nonlinear function which is a monotonic intermediate function between a linear and a logarithmic function, and the course of which in the region between 100 percent and 1 percent of the white signal value is represented by a power function $y=x^{a}$ in which $0.3 < a < 0.6$. Preferably a Munsell function.

3,590,143
SOUND SIGNAL AMPLIFIER FOR COLOR TELEVISION RECEIVER

Sho Narita, and Masanori Ogino, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1968, Ser. No. 720,049
Claims priority, application Japan, Apr. 12, 1967, Apr. 12, 1967, 42/22903; 42/22904
Int. Cl. H04n 9/16
U.S. Cl. 178—5.4 AC **1 Claim**

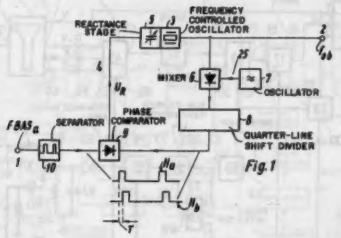


A sound signal amplifier circuit for a color television receiver, including a carrier chrominance signal amplifier and sound intermediate frequency signal amplifier for respectively amplifying a carrier chrominance signal and a sound intermediate frequency signal which are obtained by separating and detecting the output of a tuner for converting a high frequency television signal to an intermediate frequency signal, wherein said sound intermediate frequency signal is commonly amplified in said carrier chrominance signal amplifier, and its level is controlled in accordance with that of the carrier chrominance signal.

3,590,144
CHROMINANCE SUBCARRIER CONTROL IN COLOR TELEVISION TRANSMISSION

Walter Bruch, Hannover, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany

Filed Oct. 21, 1968, Ser. No. 769,307
Claims priority, application Germany, Oct. 21, 1967, P 15 37 491.1
Int. Cl. H04n 9/44
U.S. Cl. 178—5.4 **4 Claims**

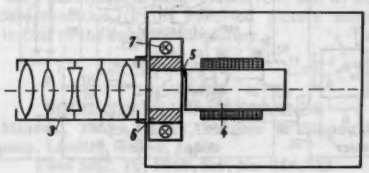


A circuit for imparting to the chrominance subcarrier to a television transmitter a desired frequency and phase relationship with the horizontal synchronizing pulses of the video information signal, which circuit includes signal-processing means for deriving from the subcarrier a pulse signal which is at the horizontal synchronizing frequency and which bears the desired frequency and phase relation to the subcarrier, a phase comparator for comparing this pulse signal with the horizontal synchronizing pulses of the information signal, and control means connected between the phase comparator and the chrominance subcarrier generator for adjusting the subcarrier generator in such a manner as to bring the pulse signal into phase coincidence with the synchronizing pulses of the information signal.

3,590,145
METHOD AND ARRANGEMENT FOR ELIMINATING PERSISTENCY EFFECTS AT LOW LIGHT LEVELS IN PLUMBICON TUBES

Hans-Dieter Schneider, Gross-Gerau; Friedrich Michels, Darmstadt; Horst Zschau, Darmstadt, and Walter Michael, Darmstadt, all of, Germany, assignors to Fernseh GmbH, Darmstadt, Germany

Filed Oct. 23, 1968, Ser. No. 769,870
Claims priority, application Germany, Oct. 25, 1967, P 15 37 125.2
Int. Cl. H04n 1/02
U.S. Cl. 178—5.4 TC **30 Claims**



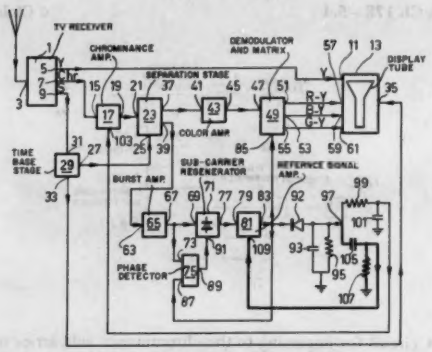
An arrangement for eliminating visible persistencies in plumbicon tubes when used in conjunction with low light levels. An auxiliary current is produced in the photolayer of

the tube for shifting the operating point for black from the origin of the diode characteristic of the tube. The shift is made to the linear portion of the tube characteristic. The signal portions arising from the auxiliary current are clipped from the output signal.

3,590,146
COLOR BURST CIRCUIT WITH A.G.C.

Peter Johannes Hubertus Jansen, and Kian Kie Ong, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1968, Ser. No. 773,206
Claims priority, application Netherlands, Nov. 8, 1967, 6,715,137
Int. Cl. H04n *9/46, 9/48*
U.S. Cl. 178—5.4 SY 3 Claims

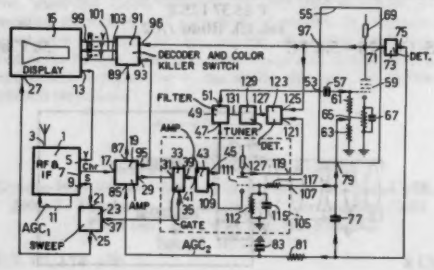


A color television receiver has at least partially separate color information and burst signal paths. A passive burst subcarrier regenerator is located within said burst signal path. In order to supply a constant amplitude regenerated subcarrier without effecting the amplitude of the color information signal, an amplitude detector is coupled to the output of the regenerator. The detected signal goes through a high-pass filter and is used to control the gain of an amplifier located exclusively within the burst signal path.

3,590,147
COLOUR KILLER CIRCUIT FOR A COLOUR TELEVISION RECEIVER

Kian Kie Ong, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1969, Ser. No. 806,928
Claims priority, application Netherlands, Mar. 26, 1968, 6,804,265
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 CK 6 Claims

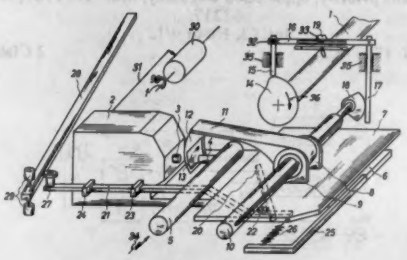


A circuit for actuating a color killer switch features a gate that passes only the color burst signal. A frequency filter filters the noise components from the gates burst, and then the signal is detected. The noise component of the gated burst signal is also detected. The detected signals are then applied to respectively activate and deactivate the killer switch to insure proper operation of the switch regardless of the signal level.

3,590,148
VARIABLE RATIO SCANNING MEANS FOR A FACSIMILE SYSTEM

Heinz Taudt, Kiel, and Ewald Lifferth, Kiel-Kronshagen, both of, Germany, assignors to Dr. Ing Rudolf Hell Kommanditgesellschaft

Filed Oct. 14, 1968, Ser. No. 767,164
Claims priority, application Germany, Oct. 18, 1967, P 15 97 229.9
Int. Cl. H04n *1/24*
U.S. Cl. 178—6 7 Claims

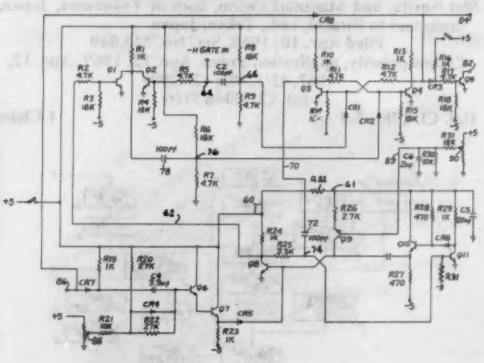


Apparatus for changing the scale of reproduction in an engraving machine employs a curved frame for holding the object to be reproduced and means for reciprocating the object before a photoscanner traveling relative to the object at a rate equal to the rate of travel of a recording head across a recording medium which is receiving a reproduction of the object.

3,590,149
TELEVISION TEST INSTRUMENT

John H. Harshbarger, Xenia, Ohio, assignor to Visual Information Institute, Inc., Xenia, Ohio

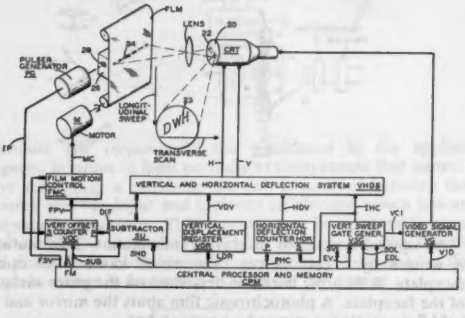
Filed Nov. 10, 1969, Ser. No. 875,442
Int. Cl. H04n *3/00*
U.S. Cl. 178—6 14 Claims



Television test instrument for developing test patterns by modulating the lines of a television raster, particularly for creating dot and bar patterns in which multivibrators are provided for creating the signals for the patterns which include components for permitting shifting of the developed pattern substantial distances and for synchronizing the developed

pattern with the horizontal rate pulses and vertical blanking pulses.

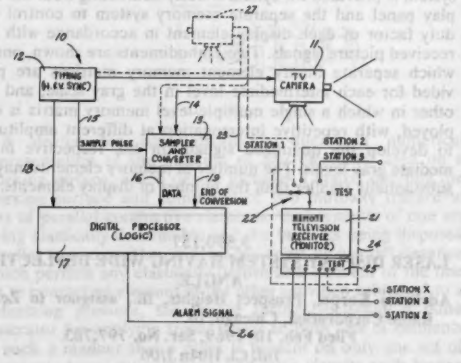
3,590,150
PHOTOGRAPHIC RECORD MEDIUM SCANNER
John A. McMahon, Yonkers; Solomon Manber, Sandspoint; Alex Rutman, Commack; Milton Schwartz, Roslyn Harbor, and Ronald F. Cooper, Plainview, all of, N.Y., assignors to Alphanumeric, Incorporated, New Hyde Park, N.Y.
Filed June 19, 1967, Ser. No. 652,648
Int. Cl. H04n *5/86*
U.S. Cl. 178—6.7 **18 Claims**



There is disclosed a system wherein a film is moved past the faceplate of a cathode-ray tube. The scanning raster of the cathode-ray tube is skewed in response to the amount of movement of the film by means of apparatus which generates signals as the film moves. The signals are used to longitudinally offset each scanning sweep (line) of the raster. Means are also provided to start and stop film movement if the offsetting exceeds certain ranges.

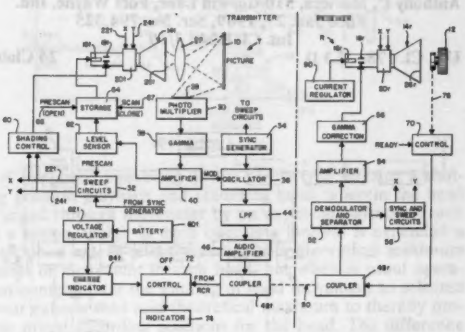
There is further disclosed a pin cushion correcting system wherein the slope of a sawtooth waveform signal used to generate a scanning sweep is controlled by means of circuits responsive at least to the amplitude of the sawtooth waveform signal.

3,590,151
TELEVISION SURVEILLANCE SYSTEM
Arlie L. Keith, Rockledge, Fla., assignor to Jackson & Church Electronics Company, Inc., Satellite Beach, Fla.
Continuation-in-part of application Ser. No. 607,600, Dec. 30, 1966. This application Nov. 30, 1967, Ser. No. 687,029
Int. Cl. H04n *7/02*
U.S. Cl. 178—6.8 **32 Claims**



A method and apparatus is disclosed by which surveillance may be maintained over a domain for detecting changes of interest in the domain and ignoring other changes. A parameter of the domain observed is scanned and sampled. The resulting sample data for individual sample points is digitized and used to update corresponding data averages over prior scans of the same sample points. Specified differences between the sample data and data average for a sample point result in modification of a suspicion value. Correlations in space and time of sample points having particular data changes further modifies the suspicion value. An output, such as an alarm, results from ultimate attainment of a predetermined suspicion value.

3,590,152
NARROW BANDWIDTH PICTURE TRANSMISSION APPARATUS
Copthorne McDonald, New York, and C. Robert Fine, Harrison, both of, N.Y., assignors to Vidcom Electronics, Inc., New York, N.Y.
Filed Nov. 13, 1968, Ser. No. 775,353
Int. Cl. H04n *5/20;* **H04n** *5/36*
U.S. Cl. 178—6.8 **10 Claims**

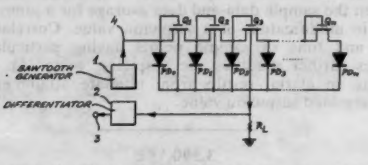


Slow-scan video apparatus for transmitting video information through a narrow band transmission path such as a telephone line, comprises a transmitter and receiver, the transmitter including a photomultiplier responsive to light from the face of a cathode-ray tube reflected from the image to be transmitted, an audio frequency oscillator the output of which is modulated by the video output from the photomultiplier tube, and means for coupling the modulated audio frequency output to the narrow band transmission line. The receiver includes demodulating means which reconstructs the video information and applies it to the cathode of an electron discharge tube to create the transmitted image on the face of the receiver tube, where it is stored, for example, by photography. The transmitted includes a shading control circuit to assure an optical input to the photomultiplier tube proportional to the reflectance of the picture being transmitted over the entire picture area, a brightness control circuit which senses the whitest portion of the image to be transmitted and correlates the modulator output to this whitest level, and a control mechanism which disables the transmitter apparatus when the receiver is not in condition to receive a transmitted image. In addition, the system includes a gamma correction circuit wherein the image is transmitted through the audio frequency transmission path in such a way that noise introduced into the received picture by the transmission path will be subjectively equal in all grey levels, and to make the grey scale rendition of the received picture subjectively similar to that of the transmitted picture.

3,590,153
SOLID-STATE IMAGE SCANNER
Yasuo Minowa, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan
Filed Sept. 10, 1969, Ser. No. 856,723
Claims priority, application Japan, Sept. 13, 1968, 43/66445
Int. Cl. H04n *1/04;* **H03k** *3/42*
U.S. Cl. 178—7.1 **1 Claim**

A solid-state image scanner comprises a plurality of field effect transistors (FET's) connected in series. A plurality of

photodiodes are connected at one of their electrodes to the junctions of the FET's, and their other electrodes are connected in common to a load resistor. A sawtooth scanning



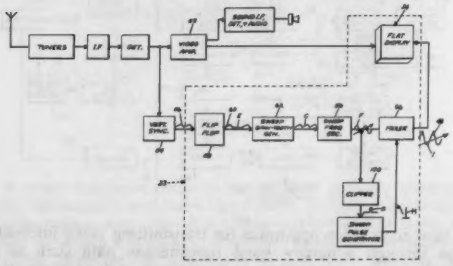
voltage is applied to one end of the series-connected FET's. An output video signal is derived across the load resistor through a differentiating circuit.

3,590,154

TELEVISION DISPLAY SYSTEM UTILIZING SCANNING BY A SINGLE ELECTRIC PULSE

Anthony C. Moricca, 510 Corwin Lane, Fort Wayne, Ind.

Filed Jan. 27, 1969, Ser. No. 794,325
Int. Cl. H04n *3/10*
U.S. Cl. 178—7.3 D **24 Claims**



A substantially flat television display device which includes display means such as gas or phosphor material, extending over a display area, these materials luminescing in response to an electric field of predetermined magnitude. Means are provided for propagating an electric wave at a television scanning rate through said luminescing materials in a scanning pattern of a television display. The propagating means includes means for developing an electric field in a localized region of the display area which is in registry with the location of the electric wave, the localized region being of a size corresponding to a picture element in a television display. Means are provided for applying a video-modulated electric field to the luminescing materials conjointly with the field of the electric wave to cause luminescence thereof in said localized region, neither of the aforementioned fields alone being of sufficient magnitude to produce such luminescence.

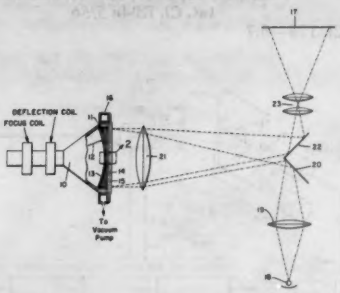
The method of this invention includes the steps of propagating an electric wave at a television-scanning rate through a luminescing means in a pattern corresponding to the scattered scanning pattern of a television display. Such luminescing means may take the form of many different luminescing materials which may be excited into luminescence by the application thereto of an electric field. The luminescing means is coextensive with the display area of an image display device. The electric wave is utilized to produce an electric field in a localized region of the display area which propagated in synchronism with the electric wave, the localized region being of a size corresponding to a picture element in a television display. Also included is the step of applying a video modulated electric field to the luminescing means conjointly with the field of the electric wave to provide a conjoint electric field of a magnitude which causes luminescence in said resultant region in registry with the propagated position of the electric wave.

3,590,155

PHOTOCHROMIC DISPLAY SYSTEM

Philip Ring, Jamaica, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of application Ser. No. 378,603, June 29, 1964, now abandoned. This application Apr. 30, 1970, Ser. No. 33,490
Int. Cl. H04n *5/66*
U.S. Cl. 178—7.5 D **8 Claims**



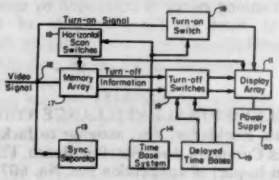
An optical system for displaying information. Information is written by a cathode-ray tube which has a fiber optic faceplate. A dichroic mirror is deposited on the outer surface of the faceplate. A photochromic film abuts the mirror and is held flat against the mirror by a suction box.

3,590,156

FLAT PANEL DISPLAY SYSTEM WITH TIME-MODULATED GRAY SCALE

Richard A. Easton, West Lafayette, Ind., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 28, 1968, Ser. No. 755,961
Int. Cl. H04n *3/10*
U.S. Cl. 178—7.5 D **10 Claims**



A picture display system using a flat panel image display device and a separate memory system for generating quantized video signals to control the display panel. A switching system is provided for synchronously addressing both the display panel and the separate memory system to control the duty factor of each display element in accordance with the received picture signals. Two embodiments are shown, one in which separate binary element memory matrices are provided for each intermediate level in the gray scale, and the other in which a single multiple-level memory matrix is employed, with repetitive interrogation at different amplitudes to develop the quantized signals for the respective intermediate gray levels. The number of memory elements may be substantially smaller than the number of display elements.

3,590,157

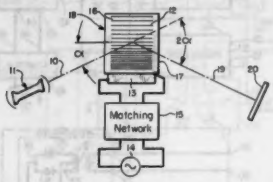
LASER DISPLAY SYSTEM HAVING WIDE DEFLECTION ANGLE

Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 10, 1969, Ser. No. 797,783
Int. Cl. H04n *3/06*
U.S. Cl. 178—7.5 **6 Claims**

A display system includes a beam of light that is repetitively deflected through a scanning pattern so as to define one

line of an image raster. The beam deflection is a result of diffractive interaction of the beam with a train of acoustic waves that change in frequency repetitively through a range of frequencies and which are developed by a source of signals that correspondingly changes frequency repetitively. A transducer responds to those signals to develop the acoustic waves and has an input at which a capacitive reactance is presented; the effect of that reactance is to



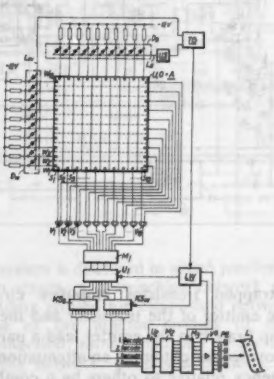
diminish the response of the transducer to the applied signals. In order at least partially to compensate that capacitive reactance, a matching network is coupled between the source and the input and includes an element which has an adjustable reactance. This element may be a saturable reactor or the like controlled so that its reactance is varied automatically to its compensatory value at each frequency as the signals change in frequency throughout their range.

3,590,158

AUTOMATIC NUMERICAL INDICATION OF SURFACE LOCATIONS

Wolfgang Pabst, Neu-Isenburg, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Aug. 26, 1968, Ser. No. 755,178
Int. Cl. G08c *21/00*
U.S. Cl. 178—18 **16 Claims**



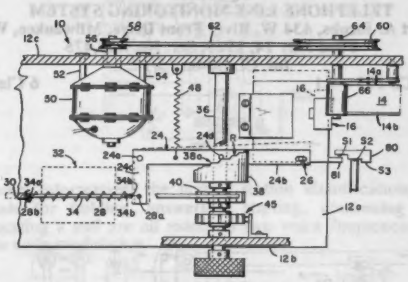
A device for automatically producing a numerical representation of the location of any elemental area on a working surface, which device includes a matrix defining the working surface and composed of two mutually transverse sets of parallel conductive elements, the elements of one set being elastically deformable and the two sets being disposed parallel to one another and spaced apart by a small distance which permits any elastically deformable element of the one set to contact an element of the other set when subjected to a deforming pressure, the device further including a pulse generator for appiying signal pulses to both sets of elements in such a manner that a pulse is present on only one set of elements at any given instant, and logic circuits each having one input connected to a respective element of one set, another input connected to a respective element of the other set, and an output at which a signal appears only when a pulse is applied to both of the elements to which its inputs are connected, this occurring when a pulse is applied to the elements of one set and one of the elements of the one set contacts one element of the other set.

3,590,159

TELEPHONE-ANSWERING DEVICE

Arnold Wolf, Brooklyn; John Simms, Yonkers, and Kalju Meri, Maspeth, all of, N.Y., assignors to Electrospace Corporation, Glen Cove, N.Y.

Filed Nov. 15, 1968, Ser. No. 776,204
Int. Cl. H04m *1/64*; G11b *5/48, 21/08*
U.S. Cl. 179—6 R **13 Claims**



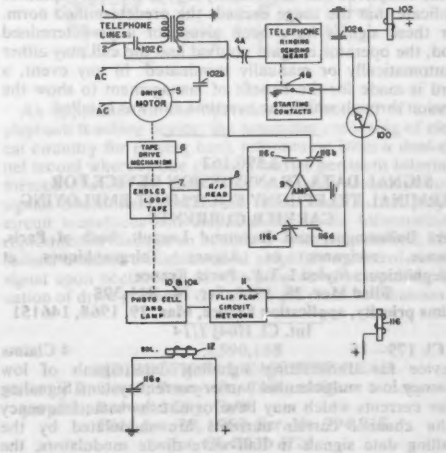
A telephone-answering device of the type utilizing a shifting position playback and recording head, wherein the head is urged through movement by an expanding member, such as a spring, which in each operating interval is expanded a prescribed extent effective to cause a theoretical maximum extent of movement in such head, but wherein usual operation contemplates the limiting of head movement to selected lesser extents than said theoretical maximum to thereby provide plural recording positions for the head. The difference between theoretical and actual head movement is readily allowed for by expansion of the spring.

3,590,160

TELEPHONE ANSWERING DEVICE WITH A CONTROL FLIP-FLOP

Kalju Meri, Maspeth, N.Y., assignor to Electrospace Corporation, Bronx, N.Y.

Filed Sept. 12, 1969, Ser. No. 857,464
Int. Cl. H04m *1/64*
U.S. Cl. 179—6 **6 Claims**



A telephone-answering device with a control transistor for controlling drive motor operation and transistor flip-flop cir-

cuitry for controlling the shift from the prerecorded announcement phase to an incoming message record phase to a standby phase. The transistor flip-flop circuitry includes a photocell and a light source between which the prerecorded announcement endless tape travels. The first shift to the incoming message record phase is controlled by the flip-flop circuitry being set to a first state by the energization of the photocell by light passing thru the endless tape. Subsequently light again reaches the photocell thru the endless tape to energize the photocell a second time. This second energization causes the flip-flop circuitry to be set a second state to cut off the control transistor to stop drive motor operation and to return the device to standby.

3,590,161

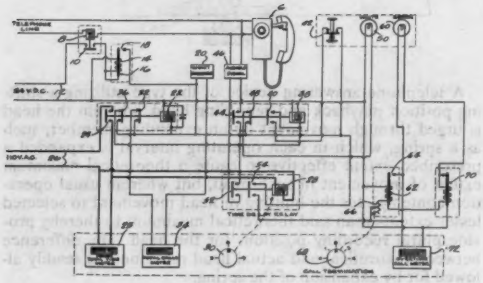
TELEPHONE LINE MONITORING SYSTEM

Albert A. Jacobs, 434 W. River Front Drive, Milwaukee, Wis.

Filed May 14, 1969, Ser. No. 824,475

Int. Cl. H04m *15/18*

U.S. Cl. 179—7.1 **6 Claims**



Initiation of a telephone call on a monitored line closes a relay which registers, and optionally makes a record of, total time of line use. A secondary relay is also closed. After a regulated period of time, this feeds periodic audible signals into the telephone line and visually signals the local operator to indicate that the usage exceeds the predetermined norm. After these signals have been given for a predetermined period, the operator is again notified and the call may either be automatically or manually terminated. In any event, a record is made for the benefit of management to show the extension through which the overtime call was handled.

3,590,162

SIGNAL DATA TRANSMISSION DEVICE FOR TERMINAL TELEPHONY EQUIPMENT EMPLOYING CARRIER CURRENTS

Robert Dallemagne, and Raymond Lerault, both of Paris, France, assignors to Lignes Telegraphiques et Telephoniques Styled L.T.F., Paris, France

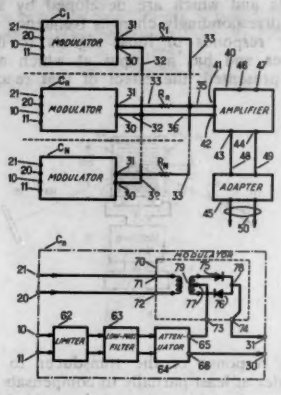
Filed Mar. 28, 1969, Ser. No. 811,395

Claims priority, application France, Mar. 29, 1968, 146151

Int. Cl. H04j *1/14*

U.S. Cl. 179—15 **4 Claims**

Device for transmitting signaling data signals of low frequency in a multichannel carrier current system. Signaling carrier currents which may have or not the same frequency as the channel carrier currents are modulated by the signalling data signals in half-wave diode modulators, the diodes being controlled by the signalling carrier currents which have an amplitude substantially larger than the signaling data signals. The modulators are connected in parallel to an amplifier with large bandwidth and low input impedance through matching serial resistors. The number of channels of



the system is reduced in order not to need individual passband filters associated with the modulators.

3,590,163

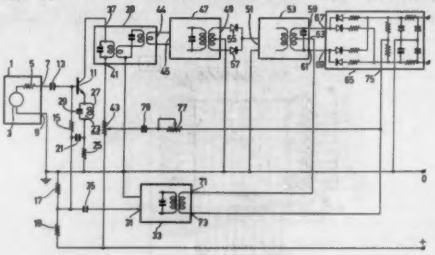
BOOTSTRAPPED TRANSISTOR AMPLIFIER CIRCUIT WITH IMPROVED UNDESIRED SIGNAL SUPPRESSION

Adriaan Charles Karman, Emmasingel, Eindhover, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 29, 1969, Ser. No. 845,703

Int. Cl. H04h *5/00*

U.S. Cl. 179—15 **5 Claims**



A bootstrapped transistor amplifier circuit in which between the emitter of the transistor and the connection of the bootstrap branch in the emitter lead a parallel resonance circuit is provided for obtaining an attenuation of at least one signal frequency relative to others by a combined action of feedback and input impedance change as function of frequency caused by the resonance circuit.

3,590,164

TRANSMISSION SYSTEM FOR TWO-LEVEL SIGNALS PROVIDING REDUCED BANDWIDTH REQUIREMENTS

Bert F. Krauss, Westport, Conn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

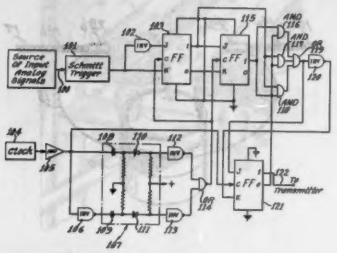
Filed July 19, 1968, Ser. No. 746,169

Int. Cl. H04b *1/66;* **H04n** *7/12*

U.S. Cl. 179—15.55 R **6 Claims**

An electrical communication system wherein two-level analog signals, as in black-and-white or message facsimile, are converted into digital signals for transmission over a transmission channel. The input signal is sampled at twice its maximum frequency (Nyquist Rate) even though the band-

width of the transmission channel limits the usable bit rate to a substantially lower value. The signal converter circuit employs perceptive coding of the signal to reduce the transmitted bit rate to a value consonant with the capacity of the

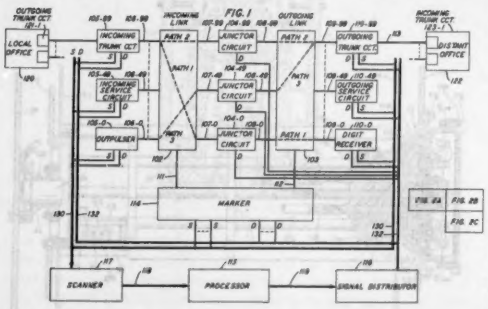


channel without loss of pulses representing a line or space of one-half the resolution size. Thus the ideal sampling rate may be used where the transmission channel will not accommodate the corresponding bit rate of the digitalized signal.

3,590,165
SWITCHING SYSTEM HAVING JUNCTOR CIRCUITS FOR HOLDING ESTABLISHED NETWORK CONNECTIONS

Robert B. Curtis, and Frederick H. Parkinson, Jr., both of Columbus, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.Y.

Filed Dec. 27, 1967, Ser. No. 693,873
Int. Cl. H04q *3/495*
U.S. Cl. 179—18 **20 Claims**



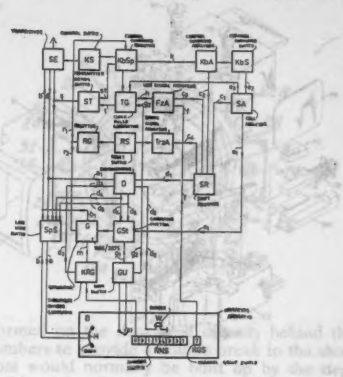
A switching system is disclosed in which junctor circuits intermediate two stages of a switching network provide the sleeve lead holding ground for established network connections. The use of the junctor circuits to maintain an established connection, rather than one of the end circuits connected to the network, permits a plurality of network paths to be in existence concurrently to a circuit having a single network appearance. Each path may be released independently of the other since the sleeve leads of the concurrent paths remain independent of each other.

3,590,166
METHOD OF AUTOMATICALLY ESTABLISHING TELEPHONE CONNECTION TO AND FROM MOBILE RADIOTELEPHONE STATIONS

Andreas Anschutz, Nurnberg; Richard Gierer, Hersbruck, and Gottfried Sentner, Nurnberg, all of, Germany, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1968, Ser. No. 721,269
Claims priority, application Germany, Apr. 14, 1967, T33656
Int. Cl. H04q *7/00*
U.S. Cl. 179—41 A **1 Claim**

A method of automatically establishing connections between mobile and fixed radiotelephone stations through fixed duplex channels wherein connections are made from the fixed station on a single channel having a different frequency than that of the speech channels. The free speech

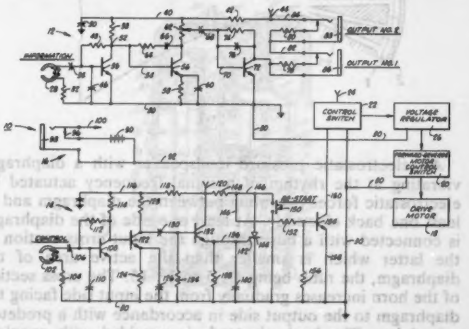


channel information, the mobile station identification, the signals for holding, answering, starting, continuing and requesting a call are all made on two voice frequencies by pulse code modulation.

3,590,167
SOLID-STATE CONTROL CIRCUITRY FOR AUDIO INFORMATION PLAYBACK APPARATUS

David D. Price, Jr., Oklahoma City, Okla., and Carl A. Helber, Tempe, Ark., assignors to Economy Company, Oklahoma City, Okla., by said Helber

Filed Oct. 1, 1968, Ser. No. 764,105
Int. Cl. G11b *15/06*
U.S. Cl. 179—100.2 **2 Claims**



An apparatus for the operation and control of a record playback teaching device, the apparatus consisting of electrical circuitry for playing back information from a dual-channel record whereby one channel carries pertinent tutoring information while the other channel carries attendant control signals intermittently recorded therealong. A first playback circuit transduces and amplifies the audio information for reproduction through an audible presentation device, while a second channel transduces and amplifies a control actuation signal upon occurrence for the purpose of controlling application of drive power to the record playback mechanism.

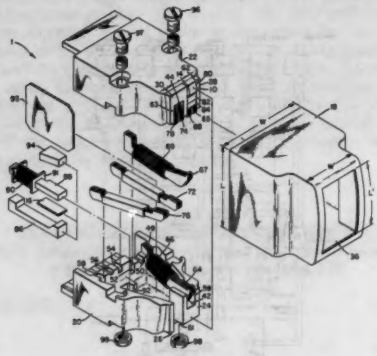
3,590,168
BIDIRECTIONAL CASSETTE HEAD

Beverley R. Gooch, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 29, 1969, Ser. No. 794,918
Int. Cl. G11b *5/28*
U.S. Cl. 179—100.2 **3 Claims**

A multichannel magnetic head assembly for a magnetic tape recorder having a narrow width tape, e.g. cassette tape

recorder. The head is adapted to incorporate within a single



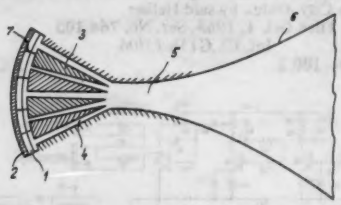
structure provisions to record, play and erase audio signals on and off the tape in both tape directions.

3,590,169

ELECTROSTATIC HORN LOUDSPEAKER

Josef Merhaut, Prague, Czechoslovakia, assignor to Tesla, Narodni podnik, Prague, Czechoslovakia

Filed Apr. 17, 1968, Ser. No. 722,107
Int. Cl. H04r *1/30, 19/02*
U.S. Cl. 179—111 **5 Claims**



An electrostatic pressure loudspeaker with a diaphragm vibrating at the rhythm of a signal frequency actuated by electrostatic forces operating between the diaphragm and at least one back electrode. At least one side of the diaphragm is connected with a horn through the input cross section of the latter which is smaller than the active area of the diaphragm, the ratio being 1 : 5 to 1 : 15. The cross section of the horn increases gradually from the input side facing the diaphragm to the output side in accordance with a predetermined law. The back electrode is provided with openings forming the input part of the horn. The input part of the horn connected directly with the diaphragm and the back electrode has a constant cross section.

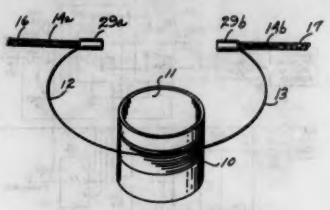
3,590,170

COIL ASSEMBLY FOR ELECTROMECHANICAL TRANSUDCER AND METHOD FOR MAKING SAME

Roderick V. Sawyer, and Adrian J. Vaksvik, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Dec. 20, 1968, Ser. No. 761,204
Int. Cl. H04r *9/02*
U.S. Cl. 179—115.5 **13 Claims**

The ends of a coiled wire are each connected to a discrete piece of flexible stranded conductor by a discrete malleable connector. The pieces of stranded conductor and discrete malleable connectors comprise severed portions of a single piece of stranded conductor and a single connector, respectively. The malleable connector has an irregular surface for disrupting an insulation coating on the wire or is a laminate with a layer of solder that removes such coating when melted. The method comprises positioning the ends of a coiled wire adjacent to a piece of stranded conductor, forming a connector therearound, and severing the connector, ends of the wire, and stranded conductor to form a pair of separate leads each comprising an end of the coiled wire and



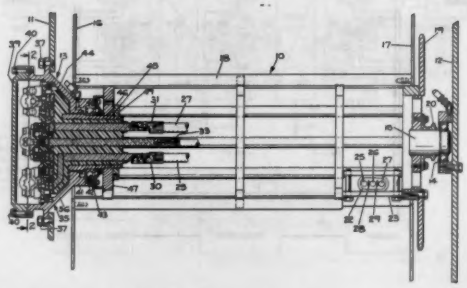
a portion of the stranded conductor connected together by a portion of the connector. When the connector is laminate, the step of securing includes heating the connector in order to melt a portion thereof.

3,590,171

ROTARY CURRENT COLLECTOR

Carl M. Harrington, Columbus, Ohio, assignor to Jeffrey Galion Inc.

Filed Jan. 6, 1969, Ser. No. 789,134
Int. Cl. H02g *11/02*
U.S. Cl. 191—12.2 **4 Claims**



A rotary current collector enclosed in a sealed housing, which is secured to a fixed part of the equipment. A rotating member of the current collector extends out through the fixed member of the current collector, with a bearing to rotatably support the rotating member. A cable reel is secured to the rotating member and is supported for rotation with the latter.

3,590,172

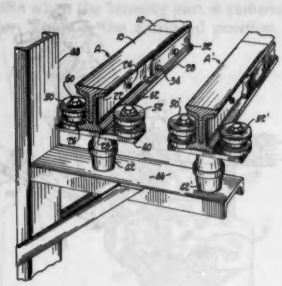
ELECTRIC POWER DISTRIBUTION SYSTEM

Roy F. Dehn, Wickliffe, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed June 26, 1969, Ser. No. 836,814
Int. Cl. B60m *1/30*
U.S. Cl. 191—32 **1 Claim**

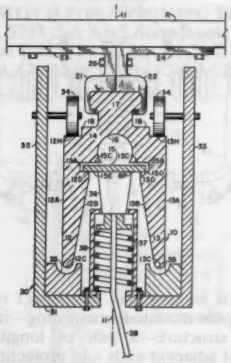
An electric power distribution system with a support for an I-shaped current conductor comprising spaced circum-

ferentially grooved, molded, electrically nonconductive rollers adapted to receive oppositely projecting flanges of the



conductor in the grooves thereof to movably support the conductor.

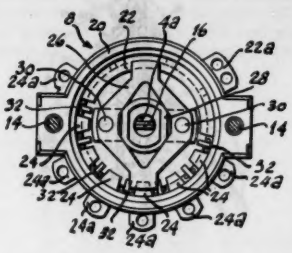
3,590,173
BUS BAR HOUSING AND RUNWAY FOR ELECTRICAL COLLECTOR HEAD
Bernhardt Stahmer, 1509 Chicago Str., Omaha, Nebr.
Filed Aug. 8, 1968, Ser. No. 751,290
Int. Cl. B60m *1/04*
U.S. Cl. 191—35 **16 Claims**



This invention relates to an elongate bus bar housing and runway for the electrical collector head of a trolley system, wherein the collector head is adapted to travel along the elongate housing and runway and direct electrical energy externally from the electrified bus bar to an electrically motivatable trolleylike apparatus. The housing and runway of the present invention is constructed primarily of a resinous electrically insulative structural material and is in direct contact with the electrically conductive bus bar, the bus bar being longitudinally slidably and loosely disposed along the housing and runway, there being longitudinal runway means to allow the collector head to be supported by and traverse along said housing and runway.

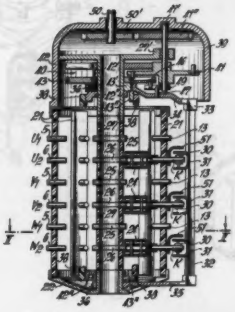
3,590,174
ARC SHIELD FOR ROTARY ELECTRICAL SWITCH
Robert C. Williams, III, Smithfield, N.C., assignor to Gutler-Hammer, Inc., Milwaukee, Wis.
Filed Mar. 26, 1970, Ser. No. 22,873
Int. Cl. H01h *9/32*
U.S. Cl. 200—10 **10 Claims**

A molded insulating ring inserted into a rotary electrical switch deck is positioned adjacent the interior deck wall and spaced off the contact members by a plurality of pads integral with the ring. Pairs of upstanding members also integral with the ring project between adjacent stationary contacts without touching the contacts and are spaced inwardly from the deck wall to intercept carbon and metallic particles emitting from arcs occurring during switch operation. Clear



areas are formed on the deck wall directly behind the upstanding members to provide a double break in the short circuit path that would normally be built up by the deposits along the wall between adjacent stationary contacts.

3,590,175
COMPOSITE SELECTOR SWITCH AND REVERSING SWITCH FOR TAP-CHANGING REGULATING TRANSFORMERS
Alexander Bleibtreu, and Josef A. Kreuzpaintner, both of Regensburg, Germany, assignors to Maschinenfabrik Reinhausen Gebruder Scheubeck K. G., Regensburg, Germany
Filed Sept. 9, 1969, Ser. No. 856,345
Claims priority, application Germany, Sept. 14, 1968, P 17 88 013.6
Int. Cl. H01h *19/58, 21/78*
U.S. Cl. 200—11 **7 Claims**

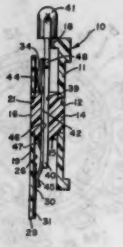


A selector switch and a reversing switch for tap-changing regulating transformers are integrated into a unitary structure performing both the function of tap-selection in connection with a tapped transformer winding and of reversing the terminals of a tapped transformer winding. This integral dual function switch is very compact, hardly exceeding the bulk of a conventional selector switch without reverse switching means.

3,590,176
SWITCH
Gregory L. Laserson, Scarsdale, and David Genovese, Spring Valley, both of, N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.
Filed Nov. 12, 1969, Ser. No. 875,720
Int. Cl. H01h *19/14*
U.S. Cl. 200—11 R **7 Claims**

A rheostat type of switch with a centrally pivoted switch lever, a plurality of spaced contacts on one side of the axis and an elongated circuit contact on the other side. A resilient contact strip carried by the lever engages, at one of its ends,

one of the spaced contacts and, at the other of its ends, the elongated contact. When the lever is rotated to establish a new circuit, a cam means moves the contact strip away from all contacts.

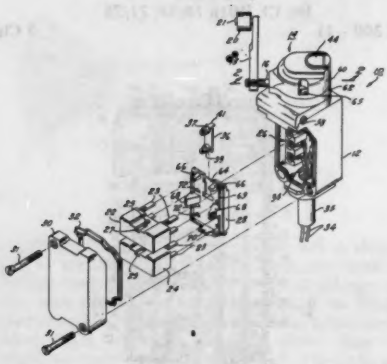


3,590,177

LIMIT SWITCH

Martin D. Ustin, Union, and Edward W. Baumgartner, Irvington, both of, N.J., assignors to Buchanan Electrical Products Corporation, Union, N.J.

Filed June 13, 1969, Ser. No. 833,018
Int. Cl. H01h *21/28*
U.S. Cl. 200—47 **24 Claims**



A limit switch in which an actuating head is mounted on the housing. Electrical switches are mounted in the housing, without fasteners, by means of a removable support structure. Eccentric adjustment members are provided for adjusting the amount of pretravel of the switch actuating mechanism. A terminal block is provided which both aids in supporting the switches and provides means for making external connection to them.

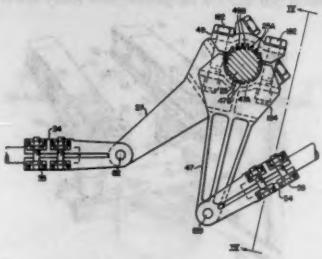
3,590,178

DISCONNECTING SWITCH HAVING IMPROVED OPERATING MECHANISM

Edmund W. Kuhn, Pittsburgh, and Samuel J. Parsons, Irwin, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 5, 1969, Ser. No. 796,719
Int. Cl. H01b *31/00*
U.S. Cl. 200—48 **7 Claims**

An electric switch comprising a plurality of switch units mounted on a supporting frame and actuated between open and closed positions by a common drive means which is operatively connected to said plurality of switch units or pole units.

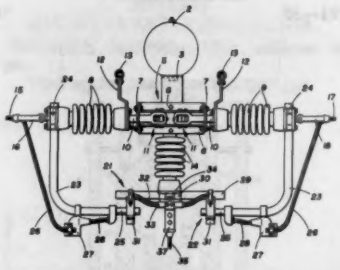


3,590,179

POLE-MOUNTED DUAL SWITCH UNIT

John G. Pahl, 1624 C. Alpine Ave., Stockton, Calif.

Filed July 7, 1969, Ser. No. 839,268
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **4 Claims**



A switch unit, of air-break disconnect type and which is adapted to be pole-mounted, comprising—in connection with a supporting structure—a pair of longitudinal insulators spaced apart at adjacent ends and projecting outward in opposite directions, a third longitudinal insulator extending laterally of said pair of insulators and projecting outward in a vertical plane therebetween, each insulator of the pair being mounted for part circle rotation about its axis, a switch formed between each rotatable insulator and the third insulator and such switch being opened or closed by part circle rotation of said insulator in one direction or the other, there being means connected to the rotatable insulators to selectively rotate the same, the outer end of each of the three insulators being adapted for coupling to a separate and corresponding circuit cable, and circuit means arranged with said circuit cables and switches in a manner such that, when the latter are closed, the circuit cable coupled to the pair of insulators are individually electrically connected to the circuit cable coupled to the third insulator.

3,590,180

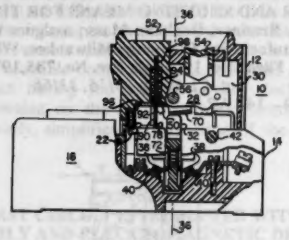
MANUALLY OPERATED TOGGLE-ACTING SWITCH HAVING A MEANS FOR PREVENTING ASSEMBLY OF THE SWITCH WITH THE CONTACTS OF THE SWITCH IN A CIRCUIT-CLOSING CONDITION

Jordan F. Puetz, Milwaukee; Joseph J. Gribble, Milwaukee, and James P. Schmiedel, Brown Deer, all of, Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Feb. 6, 1970, Ser. No. 9,160
Int. Cl. H01h *9/22, 3/46*
U.S. Cl. 200—50 A **10 Claims**

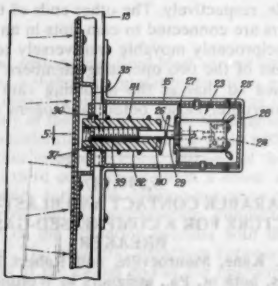
A manually operated switch having a toggle lever actuating mechanism included in a housing part which may be readily

removed from a base carrying the stationary contacts of the switch to permit inspection of the current carrying contacts of the switch. The switch includes a slider which moves to an activated position when the housing part is removed from the base. The slider, when in the activated position, causes the



levers of the toggle mechanism to move and be maintained in an OFF operating position so that the toggle mechanism must be reset after the housing is remounted on the base before the levers of the toggle mechanism can be moved to the ON position.

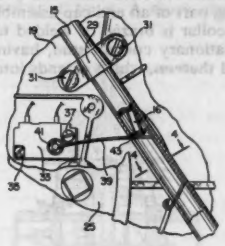
3,590,181
LANE SWITCH FOR SWIMMING TIMERS
Joseph G. Baran, 3737 Oak Ave., Northbrook, Ill.
Filed Feb. 4, 1970, Ser. No. 8,451
Int. Cl. H01h *35/00, 3/16, 3/02*
U.S. Cl. 200—52 **5 Claims**



A frame mounted on the side of a swimming pool has horizontal supports extending across one end of a swimming lane. Mounted on these supports for limited horizontal movement in line with the lane are a plurality of spaced, vertical panels positioned side-by-side across the end of the lane. These panels are biased outwardly and the supports carry an electrical switch for each panel so that when the panel is pushed inwardly by a swimmer arriving at the end of the lane, the switch will be actuated to supply an electrical indication to a timing apparatus.

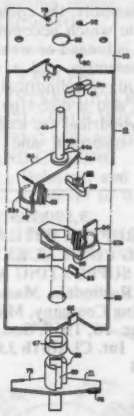
3,590,182
ARTICLE FEEDER AND DELIVERY MECHANISM HAVING A SHUTOFF SWITCH
Robert L. Beckhardt, Towson, and Richard T. Walter, Baltimore, both of, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.
Filed Dec. 16, 1969, Ser. No. 885,484
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.41 **2 Claims**

A mechanism including a rotatable motor driven drum which feeds headed studs to a delivery tube adapted to be connected to a stud gun. A normally closed switch, in series with the drum-driving motor, is opened momentarily each



time a stud is fed to the delivery tube. When studs fill the delivery tube to a preselected extent, the switch remains open and the motor turns off.

3,590,183
QUICK-MAKE AND QUICK-BREAK SWITCH
Merrill G. Leonard, Fowler, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 31, 1967, Ser. No. 657,114
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 **19 Claims**

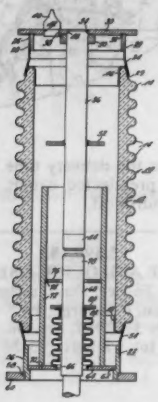


This invention relates, generally, to quick-make and quick-break types of switches and, more particularly to an improved quick-make and quick-break type of switch, which may be readily mounted on transformer installations and operated with facility for sectionalizing cables in the distribution system, and as a load-break switch at the transformer itself.

3,590,184
HIGH-VOLTAGE OUTDOOR VACCUM SWITCH WITH CONDUCTIVE COATING SERVING AS ELECTROSTATIC SHIELD MEANS AND END CAP-MOUNTING MEANS
Zygmunt A. Wachta, Boston, and Oscar L. Larkin, Saugus, both of, Mass., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Dec. 9, 1968, Ser. No. 782,373
Int. Cl. H01h *33/66, 17/42*
U.S. Cl. 200—144 B **8 Claims**

A high-voltage vacuum switch for outdoor use comprises a hollow cylindrical skirted ceramic envelope having electri-

cally conductive coatings on the inner and outer surfaces at each end. End cap assemblies are provided at each end and each assembly comprises a ring of material thermally compatible with the envelope, which is brazed to a metal coating, fused to the ceramic and the other end of the ring welded to a collar forming part of an end cap assembly. In one end cap assembly, the collar is brazed or welded to a plate which is brazed to a stationary contact stud, having a disc-type arc shield attached thereon, which extends into the envelope. In



the other end cap assembly, the collar is brazed or welded to a plate having a hole which accommodates a movable contact stud. A bellows is brazed or welded between the plate of the said end cap assembly and a washer attached to the movable contact stud. A cylindrical arc shield is brazed or welded to the plate and a disc-type arc shield is brazed or welded inside the cylindrical arc shield Both end cap assemblies are provided electrical and mechanical connection means.

3,590,185

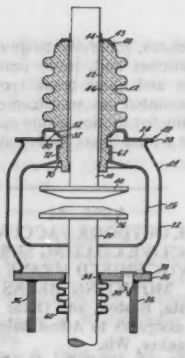
VACUUM INTERRUPTER WITH SINGLE INSULATING MEMBER HAVING CONICAL EXTERIOR ATTACHING SURFACES AND SUPPORTING A FLOATING SHIELD

Herbert M. Pflanz, Roslindale, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 16, 1968, Ser. No. 783,840

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **2 Claims**



A vacuum interrupter comprises an insulating member through which a stationary contact rod extends. A metallic housing is mounted on the insulating member and surrounds the stationary contact rod and a movable contact rod which extends into the housing through flexible sealing means. A metallic floating shield is supported on the insulating member within the housing and surrounds portions of the stationary and movable contact rods and the contacts thereon.

3,590,186

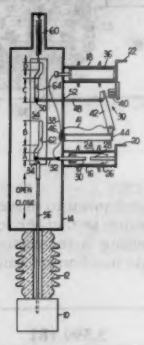
VACUUM INTERRUPTER HAVING SERIES CONNECTED RESISTOR AND SHUNTING MEANS FOR THE LATTER

Rochard G. Brunner, Dedham, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 19, 1968, Ser. No. 785,197

Int. Cl. H01h *33/16, 33/66*

U.S. Cl. 200—144 AP **7 Claims**



A vacuum interrupter employing a reciprocably movable contact has an opening and closing resistor in series circuit therewith and a knife switch is connected across the resistor to shunt it in and out of circuit. Two reciprocably movable operating members are connected at one of their ends to the movable contact of the vacuum interrupter and to the knife switch blade, respectively. The other ends of the two operating members are connected to cam slots in an actuating cam which is reciprocably movable transversely to the direction of movement of the two operating members. The cam slots are fashioned so that as the actuating cam is moved the vacuum interrupter closes before and opens after the knife switch.

3,590,187

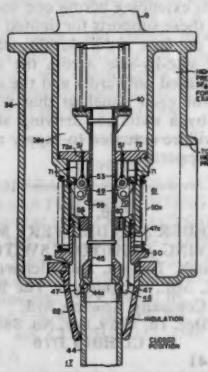
SEPARABLE CONTACT AND BLAST-VALVE STRUCTURE FOR A COMPRESSED-GAS CIRCUIT BREAKER

Richard E. Kane, Monroeville, and Robert L. Hess, North Versailles, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1970, Ser. No. 4,485

Int. Cl. H01h *33/82, 33/54*

U.S. Cl. 200—148 R **7 Claims**



A separable contact structure is provided for a compressed gas circuit interrupter involving a differential blast valve

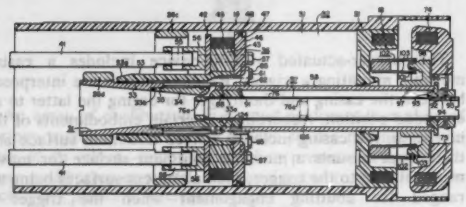
cooperating with an orifice chamber, or an interrupter chamber, to direct the gas flow during the opening operation. The construction is such that a contact follower initially follows the opening movement of the movable contact, until it is picked up and retracted by the opening movement of a differentially acting blast valve. Subsequently, upon a pressure equalization, the spring-biased blast valve recloses, carrying with it the contact follower, so that in the fully open circuit position of the interrupter the blast valve is closed, and the arc horn follower is extended. Contact is initially made between the movable contact and the extended contact follower contact during the closing stroke. Such structure eliminates erosion on the main stationary contact fingers, and, additionally, simplifies the actuation of the blast valve structure.

3,590,188

FLUID-BLAST CIRCUIT INTERRUPTER WITH PISTON ASSEMBLY AND ELECTROMAGNETIC DRIVING MEANS

Russell E. Frink, and William H. Fischer, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 1, 1966, Ser. No. 576,740
Int. Cl. H01h *33/90*
U.S. Cl. 200—148 **14 Claims**



An improved piston-type fluid-blast circuit interrupter is provided having a stationary operating cylinder, within which reciprocates a movable piston assembly carrying the movable contact assembly of the interrupter. Electromagnet means including three accelerating coils, one movable with the piston assembly, another located in the closed end of the operating cylinder, and a third coil movable with a driver unit, are all connected in series during the opening operation of the interrupter. The driver unit is mechanically connected through the closed end of the operating cylinder with the movable piston assembly. The magnetic attraction between the piston coil and the coil at the closed end of the operating cylinder, and the magnetic repulsion forces between the coil at the closed end of the operating cylinder and the coil carried by the driver unit, all contribute to magnetically assisting the fluid-driving motion of the piston assembly and so effecting interruption.

The movable contact structure comprises a main movable contact and an inner movable arcing probe movable together and insulated from each other with the three accelerating coils connected between the main movable contact and the movable arcing probe in the closed position of the interrupter.

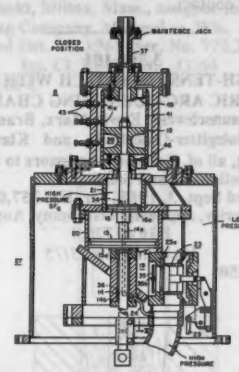
3,590,189

PNEUMATIC OPERATING MECHANISM FOR A CIRCUIT INTERRUPTER WITH PISTON DEVICE HAVING AN OPENING PISTON AND A CLOSING PISTON

William H. Fischer, Pittsburgh, and Wayne S. Aspey, Monroeville, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1968, Ser. No. 762,479
Int. Cl. H01h *33/30*
U.S. Cl. 200—148 **15 Claims**

A circuit interrupter has a movable contact structure which is piston actuated. The operating piston rod has an opening piston and a closing piston secured thereto, so that upon entrance of high-pressure gas on one side of the opening piston, the opening piston will move to the open position carrying with it the movable contact structure. The closing piston, secured to the piston rod, has high-pressure gas acting on one side thereof at all times. A shock absorber structure



may be used, and if used is also fixedly secured to the movable operating piston rod for the movable contact structure.

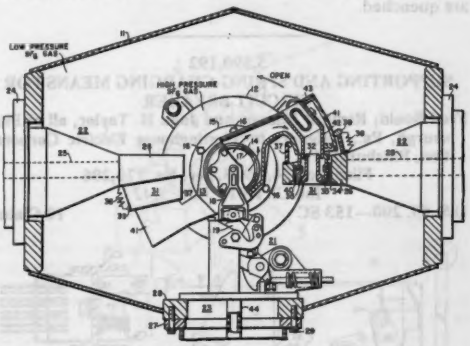
Upon exhausting the high-pressure gas from the one face of the opening piston, the closing pressure, constantly acting upon one side of the closing piston, will effect a closing operation of the contact structure.

3,590,190

GAS BLAST CIRCUIT INTERRUPTER WITH MOVABLE FLOW DIRECTOR ENGAGABLE WITH A STATIONARY RESISTANCE INSERTING MEANS DURING OPENING AND CLOSING

Robert G. Colclaser, Jr., Delmont, and Charles F. Cromer, Trafford, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 5, 1968, Ser. No. 773,510
Int. Cl. H01h *33/74, 33/16*
U.S. Cl. 200—148 **9 Claims**



In order to reduce the rate of rise of the recovery voltage of a kilometric or short-line fault, resistors are connected in the circuit to be interrupted during an opening operation. A resistor is provided on each one of two terminal bushings extending through the ends of the housing for each interrupting unit of a circuit breaker. The resistors also function to divide the voltage equally across the two series breaks in the interrupter and they function as damping resistors to prevent restrikes during opening and excessive over voltages during

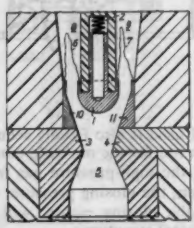
closing. During opening, the resistors are inserted in the circuit and then are disconnected. During closing, the resistors are inserted in the circuit and then shorted out of the circuit. The resistor contacts are mounted on a stationary flow director and are engaged by the outer surface of a conductive movable flow director which is concentric with the movable hollow contact.

3,590,191

LIQUID HIGH-TENSION SWITCH WITH TUBELIKE ELECTRIC ARC-QUENCHING CHANNELS

Dieter Kind, Braunschweig; Erwin Marx, Braunschweig; Jurgen Salge, Salzgitter-Osterlinde, and Klaus Mollenhoff, Braunschweig, all of, Germany, assignors to Dieter Kind, by said Marx, Mollenhoff and Salge

Filed Sept. 3, 1968, Ser. No. 757,044
Claims priority, application Germany, Aug. 31, 1967, P 16 40 720.8
Int. Cl. H01h *33/75*
U.S. Cl. 200—150 **9 Claims**



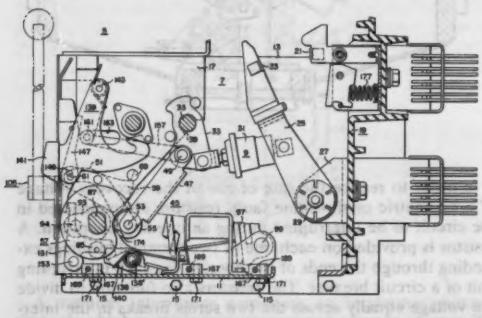
Circuit breaker having a quenching chamber in which a movable contact member is moved from a first position electrically connecting two stationary contact members to a second position for electrically disconnecting such stationary contact members; electric arcs being formed in one general direction between the movable and stationary contact members during such movement of the movable contact member. The movable contact member being moved by means of introducing a stream of arc-quenching fluid in a direction transverse to the direction in which such arcs are formed. Such arcs being driven by the arc-quenching fluid into a plurality of tubelike channels extending in the direction of movement of the movable contact member where the arcs are quenched.

3,590,192

SUPPORTING AND SPRING-CHARGING MEANS FOR CIRCUIT BREAKER

Fred Bould; Richard Hauser, and John H. Taylor, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 24, 1968, Ser. No. 770,296
Int. Cl. H01h *3/30, 3/42*
U.S. Cl. 200—153 SC **10 Claims**



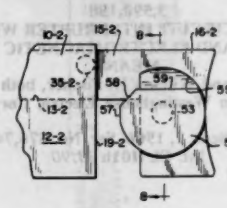
A circuit breaker comprises improved means for supporting the parts of the circuit breaker to provide for easier assembly of the breaker and to provide operational advantages. A spring-charged means is held in charged position by a latch member engageable with a portion of a closing cam, and is released by rotation of said closing cam.

3,590,193

TRIGGER-ACTUATED SWITCH DEVICE WITH ADJUSTMENT MEANS FOR ESTABLISHING A PLURALITY OF PREDETERMINED TRIGGER POSITIONS

Carl J. Frenzel, Chicago, Ill., assignor to Skil Corporation, Chicago, Ill.

Division of Ser. No. 733,044, May 29, 1968, filed Mar. 18, 1970, Ser. No. 20,651
Int. Cl. H01h *13/08*
U.S. Cl. 200—157 **5 Claims**



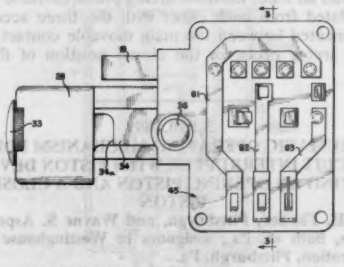
The trigger-actuated switch device includes a casing movably mounting a trigger. Resilient means are interposed between the casing and the trigger for urging the latter to an extended position. According to certain embodiments of the invention, the casing includes a fixed abutment surface and the trigger mounts a movable abutment surface for movement relative to the trigger, such abutment surfaces being arranged for abutting engagement when the trigger is depressed. The position of the movable abutment surface determines the extent of movement of the trigger when the same is squeezed or depressed. According to other embodiments, the same result is achieved by mounting the fixed abutment surface on the trigger and the movable abutment surface on the casing. A lock button construction is provided for locking the trigger in its fully depressed position and in its intermediate position or positions determined by engagement of the abutment surface.

3,590,194

CONTACT- AND CIRCUIT-MOUNTING BOARD FOR TRIGGER-OPERATED SWITCH UNIT

Carl J. Frenzel, and Alex F. Gawron, both of Chicago, Ill., assignors to Skil Corporation, Chicago, Ill.

Filed Sept. 19, 1969, Ser. No. 859,277
Int. Cl. H01h *13/08*
U.S. Cl. 200—157 **11 Claims**



A contact- and circuit-mounting board of unitary construction is contained within the housing of the switch unit. This board mounts fixed contacts which cooperate with other contacts carried by a reversing lever mounted adjacent the trigger. This board also mounts contact strips which are

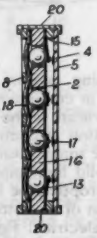
slidably engaged by contact fingers carried by the trigger thereby to define an on-off switch, a bypass switch and a variable resistor forming part of a speed control circuit. The elements of the circuit are contained on a printed circuit board, the latter being secured to the mounting board.

3,590,195

OILCAN PUSHBUTTON SWITCH

Douglas Louis Ashton Driver, Chislehurst, Kent, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 31, 1968, Ser. No. 772,166
Claims priority, application Great Britain, Nov. 2, 1967, 49889/67
Int. Cl. H01h *3/12*
U.S. Cl. 200—159B **3 Claims**



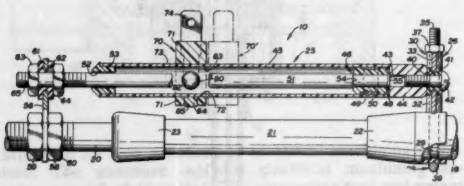
An array of pushbuttons is formed as domes in a plate of springy material. The domes behave in the manner of the base of an oilcan—snapping in when pressure is applied to close pushbutton contacts and snapping out to open the contacts when pressure is released.

3,590,196

SELECTIVE POSITION READ-OFF DEVICE FOR PUSH-PULL CABLE CORES

Richard D. Houk, Stow, Ohio, assignor to Morse Controls Inc., Hudson, Ohio

Filed Jan. 6, 1969, Ser. No. 789,220
Int. Cl. H01h *17/04, 17/14*
U.S. Cl. 200—161 **7 Claims**



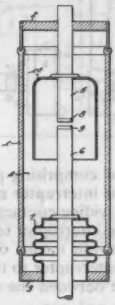
A read-off device for a push-pull control cable. A barrel is anchored to the casing of the push-pull cable through a resilient attachment. The resilient attachment precludes axial movement of the barrel with respect to the casing of the push-pull control cable but permits gyration of the barrel with respect thereto. A plunger is slidably received within the barrel and a rod means connects the plunger to the core of the push-pull control cable, also preferably through a resilient attachment that precludes axial movement of the plunger with respect to the core but permits it to move axially with the core and gyrate with respect thereto. One or more tap members are selectively positionable along the barrel. The tap members carry buttons that are biasingly urged through selectively bored, diametric access apertures in the barrel for engagement with a contact on the plunger when the plunger is positioned therebetween so as to complete an electrical circuit therebetween, connection to which is accomplished through terminals on the tap member.

3,590,197

ELECTRICAL CONTACTS CONTAINING GETTERING MATERIAL

Henry J. Wesoloski, Milton, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Oct. 31, 1968, Ser. No. 772,347
Int. Cl. H01h *1/02, 33/66*
U.S. Cl. 200—166 C **2 Claims**



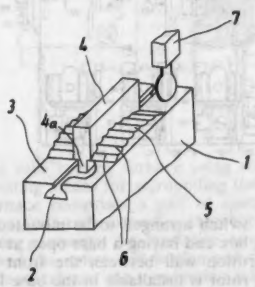
An electrical contact for a vacuum interrupter consists of a binary alloy of 95 to 99 percent tungsten and 1 to 5 percent tantalum, which alloy when heated during contact arcing getters undesirable hydrogen which may be present in the interrupter.

3,590,198

CONTACT BREAKER FOR ELECTRIC CIRCUITS

Artur Fischer, Altheimer Str. 219, D-7241 Tumlingen, Germany

Filed June 13, 1969, Ser. No. 833,015
Claims priority, application Germany, June 26, 1968, P 17 65 656.3
Int. Cl. H01h *1/06*
U.S. Cl. 200—166 G **7 Claims**

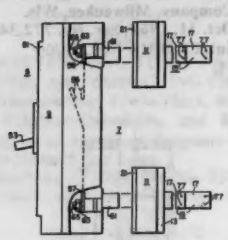


A contact breaker for electric circuits which comprises first and second current conductive elements with the latter element slidably engaging the first element and forming an electric circuit therewith. An interruptor member is slidably fixed on the first element and is located in the path of the second element and has a surface electrically insulated from the first element so that upon engagement of the second element with this surface the electric circuit is broken. Means are provided on the surface of the interruptor member which are adapted to remove impurities collected on the second element during sliding thereof along the first element.

3,590,199
PLUG-IN-TYPE SWITCHGEAR

Alfred E. Maier, Beaver Falls, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1970, Ser. No. 9,376
Int. Cl. H01h 9/02
U.S. Cl. 200—168 A 13 Claims

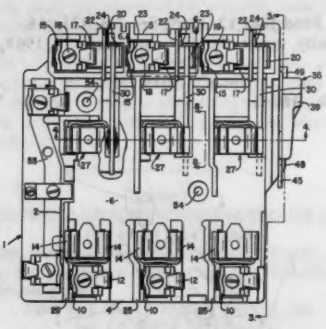


Plug-in-type switchgear comprising plug-in support means and a plug-in-type circuit interrupter on said support means with improved means providing contact pressure between the support terminals and the interrupter terminals. The arrangement also provides improved means operable to simultaneously secure the circuit interrupter to the support means and provide contact pressure between the support terminals and the interrupter terminals.

3,590,200
ELECTRIC SWITCH

Tadeusz J. Rys, Lexington, Ky., and Tadeusz J. Rys, Lexington, Ky., assignors to Square D Company, Park Ridge, Ill. and Square D Company, Park Ridge, Ill.

Filed Dec. 17, 1969, Ser. No. 885,882
Int. Cl. H01h 9/02, 9/02
U.S. Cl. 200—168 10 Claims



An electrical switch arranged to be mounted on the rear wall of a switch box and having a base open at the front and rear with a partition wall between the front and rear. A blade-operating rotor is installable in the base from the rear and held in operating position behind the partition wall initially by a snap spring detent to facilitate installation of the base on the rear wall. Once installed, a flange on the rotor cooperates with the rear wall to retain the rotor in operating position should the spring fail.

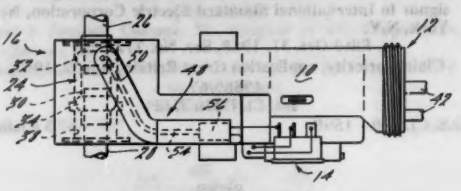
The load and line connectors are mounted on the front face of the partition wall for ready access when the front of the switch box is open.

The switch blades and companion stationary contact jaws are carried by the base at the rear of the partition wall, and are drivingly engaged by the rotor. The blades are arranged relative to the contact jaws, rotor, and base so as to provide a wider contact separation upon opening of the switch than is usual in switches of comparable size.

3,590,201
PHOTOELECTRIC CONTROL SYSTEMS FOR BRAZING TOOLS

Charles B. Basinger, Parma, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed May 14, 1969, Ser. No. 824,469
Int. Cl. H05b 5/00
U.S. Cl. 219—8.5 4 Claims

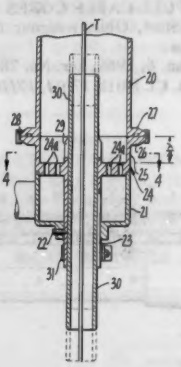


A temperature-sensing system which is particularly adapted to be utilized in conjunction with a brazing operation wherein the temperature at the point of brazing is sensed and the brazing operation is controlled in response to the sensed temperature, the temperature being sensed by means of a fiberoptic or a solid light pipe. The light being transmitted through the fiberoptic pipe is then translated through a transducer in the form of a photoelectric device to change the light signal to an electrical signal. The intensity of the electrical signal is then sensed to control the termination of the brazing cycle.

3,590,202
CONSTRUCTION FOR TUNING MICROWAVE HEATING APPLICATOR

John D. A. Day, Berkeley, and Edward J. Hunt, San Francisco, both of, Calif., assignors to Bechtel Corporation

Filed Feb. 24, 1970, Ser. No. 13,321
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 6 Claims

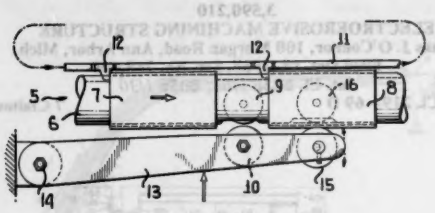


A microwave heating applicator that operates in the TM modes having a substantially cylindrical resonant cavity in which elongate material is heated while being processed therethrough. A microwave heating applicator having a perforated end cap on one end, said end cap having perforations for admitting heated air into the cavity, the size of each perforation being sufficiently small relative to its length to attenuate the transmission of microwave energy, a manifold for receiving heated air and guiding the air toward the perforations in the end cap; and a cylindrical metal sleeve mounted in openings through the end cap and manifold, one end of said sleeve projecting into the resonant cavity and the other end being accessible for adjusting its axial position as to tune the cavity.

3,590,203
FIXED GAP AUXILIARY ROLL FOR SEAM WELD ELECTRODE LEVER

Harold J. Gieffers, Hinsdale, and Larry M. Rogers, Chicago, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Feb. 3, 1969, Ser. No. 796,014
Int. Cl. B23k *11/30*
U.S. Cl. 219—66 10 Claims

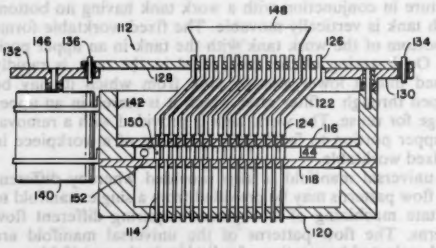


This disclosure relates to an electrode support for a welding apparatus for welding lap seams of tubular members passing along a support at regularly spaced intervals. The welding apparatus includes a fixed electrode and a movable electrode, and the movable electrode is supported in such a manner wherein although it is constantly urged towards the fixed electrode, engagement of the movable electrode with the fixed electrode is prevented by the existence of an adjacent tubular member. This is accomplished by the support for the movable electrode having a stop member which is engageable with an adjacent tubular member.

3,590,204
STRUCTURE FOR ELECTROEROSIVE MACHINING WITH ROTATING TUBULAR ELECTRODES

Thomas J. O'Connor, 100 Morgan Road, Ann Arbor, Mich.

Filed May 16, 1968, Ser. No. 729,584
Int. Cl. B23p *1/08, 1/04*
U.S. Cl. 219—69 V 3 Claims



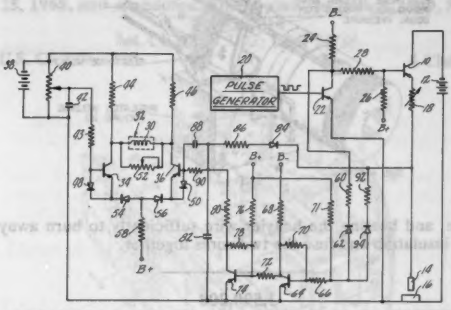
Structure for and a method of electrical machining is disclosed. The structure includes electrical machining apparatus, a quick-change electrode supporting tool and means for rapidly and accurately securing the electrode-supporting tool to the electrical machining apparatus.

3,590,205
SERVO FEED CONTROL FOR ELECTRICAL DISCHARGE MACHINING

Ronald L. Syria, Inkster; Dalton R. Verner, Orchard Lake, and John W. McGuffin, Troy, all of, Mich., assignors to Elox Inc., Troy, Mich.

Filed Dec. 8, 1969, Ser. No. 883,195
Int. Cl. B23p *1/14*
U.S. Cl. 219—69 20 Claims

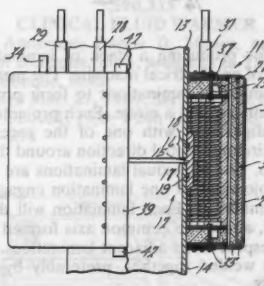
The servo feed system provided in accordance with our invention is operable to provide stable operation even at machining conditions where machine pulse off-time is relatively long as compared to pulse on-time. Signal networks are connected to the electrically energized servocontrol element from an intermediate drive stage and from the gap, respectively, to provide a down-feed signal at all times when required during machining operation. In addition, the servo feed system incorporates a novel sensing circuit which provides control through a combined striking voltage and cutting voltage signal.



3,590,206
FLEXIBLE ELECTRIC TUBE BRAZING FURNACE

Ernest T. Lago, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 5, 1970, Ser. No. 8,911
Int. Cl. B23k *1/04*
U.S. Cl. 219—85 10 Claims



A portable tube brazing furnace using resistance heating and incorporating means for surrounding the joint with inert gas. The furnace comprises a pair of spaced parallel link chains with ceramic rods extending therebetween and carrying the heating elements. An insulative cover is carried by the chains, and the entire unit is clamped around the joint. Combined electrical and gas conducting tubers extend into the furnace so that inert gas may surround the joint during brazing.

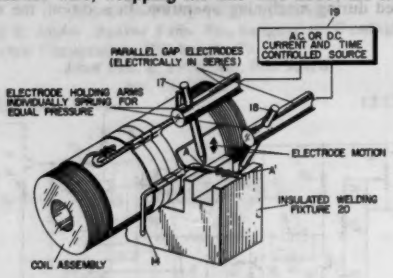
3,590,207
METHOD OF JOINING WIRES OF DIFFERENT DIAMETERS

Gerald S. Cox, Waynesboro, Va., assignor to General Electric Company

Filed June 16, 1969, Ser. No. 833,261
Int. Cl. B23k *11/10*
U.S. Cl. 219—85 4 Claims

A fine enamel insulated wire is joined to a heavier diameter wire by a method including the boriding and plating of

the heavier wire, wrapping the fine wire about the heavier


A.C. OR D.C. CURRENT AND TIME CONTROLLED SOURCE
PARALLEL GAP ELECTRODES (ELECTRICALLY IN SERIES)
ELECTRODE HOLDING ARMS INDIVIDUALLY SPRUNG FOR EQUAL PRESSURE
ELECTRODE MOTION
INSULATED WELDING FIXTURE 20
COIL ASSEMBLY

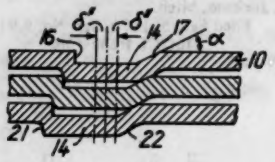
wire, and heating the heavier wire sufficiently to burn away the insulation and fuse the two wires together.

3,590,208

METHOD OF ALIGNING AND WELDING LAMINATED SHEETS FOR ELECTRICAL MACHINES

Paul Martini, Sandkrug; Gotz Mrowka, Oldenburg, and Heinz-Hermann Hasche, Oldenburg, all of, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frandfurt am Main, Germany

Filed Nov. 4, 1968, Ser. No. 773,133
Claims priority, application Germany, Nov. 2, 1967, Jan. 5, 1968, P 16 13 282.4; P 16 38 223.3
Int. Cl. B23k *11/26*
U.S. Cl. 219—92 **13 Claims**



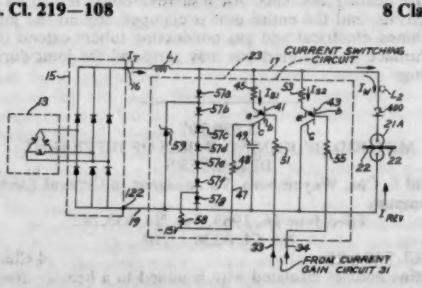
A method for producing a stack of laminations for the rotor or stator of an electrical machine. The method involves stamping a number of laminations to form projections and recesses at points around a circle. Each projection is formed in mating configuration with one of the recesses but displaced in the circumferential direction around the circle with respect thereto. The individual laminations are then stacked so that the projections of one lamination engage a recess of an adjacent lamination. Each lamination will then be angularly displaced, about the common axis formed by all of the circles, with respect to its adjacent laminations. The laminations are then welded together, preferably by a projection welding process.

3,590,209

CONTROL CIRCUITRY FOR DIRECT CURRENT

James P. Tatham, Wheaton, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 3, 1968, Ser. No. 726,440
Int. Cl. B23k *11/24*
U.S. Cl. 219—108 **8 Claims**



Control circuitry is disclosed herein for controlling the flow of direct current through a load. The control circuitry includes a switching circuit for selectively switching the current flowing through the load to ON and OFF conditions at a high repetition rate.

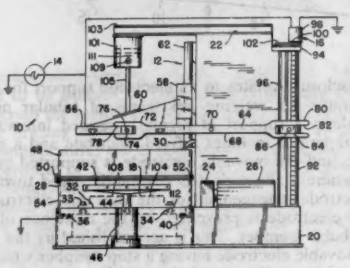
One embodiment of the control circuitry is particularly adapted for use with, and forms an integral part of, a direct current electrical resistance welding system for welding metallic blanks which are serially passed between cooperating welding electrodes.

3,590,210

ELECTROEROSIVE MACHINING STRUCTURE

Thomas J. O'Connor, 100 Morgan Road, Ann Arbor, Mich.

Filed Oct. 18, 1968, Ser. No. 768,699
Int. Cl. B23p *1/08;* **B05b** *1/30*
U.S. Cl. 219—69 D **7 Claims**



A machine tool for electrical machining is disclosed which includes parallel linkage structure for moving an electrode toward and away from a workpiece. The parallel linkage structure, as disclosed, is driven by servo means to maintain a predetermined spark gap between an electrode secured to the machine tool structure and a workpiece supported thereby.

A fixed worktable is provided as part of the machine tool structure in conjunction with a work tank having no bottom which tank is vertically movable. The fixed worktable forms the bottom of the work tank with the tank in an upper position. On lowering of the tank, fluid in the tank is rapidly drained into a lower storage tank from which it may be pumped through a filter after which it is stored in an upper storage for reuse. The work tank is provided with a removable upper portion to facilitate positioning of a workpiece in the fixed worktable.

A universal manifold is also provided whereby different fluid flow patterns may be provided from a single manifold to facilitate machining of workpieces requiring different flow patterns. The flow patterns of the universal manifold are readily selected by rotation of cylinders in the manifold.

3,590,211

METHOD OF MAKING HIGH STRENGTH WELDS IN HY-110 TO HY-150 STEEL

John T. Ballass, Norwich, and Samuel Goodman, New London, both of, Conn., assignors to General Dynamics Corporation, New York, N.Y.

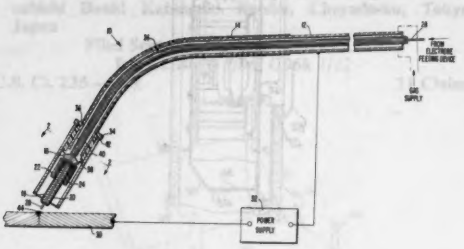
Continuation of application Ser. No. 475,854, July 29, 1965, now abandoned. This application Mar. 28, 1968, Ser. No. 717,030
Int. Cl. B23k *9/00*
U.S. Cl. 219—137 **7 Claims**

A method of making weld metal having a yield strength in the range of from about 110,000 p.s.i. to about 150,000 p.s.i. and high toughness comprising the step of consuming in a shielded arc a weld wire consisting essentially of, by weight, about 0.12 percent maximum carbon, 0.010 percent maximum phosphorus, 0.010 percent maximum sulfur, 1.2 percent to 2.00 percent manganese, 0.40 percent to 1.00 silicon, 1.5 percent to 3.0 percent nickel, 0.40 percent to 1.00 percent molybdenum, 0.40 percent to 1.00 percent copper, 0.08 percent maximum zirconium, the remainder being essentially iron.

3,590,212
ANODIZED ALUMINUM WELDING TORCH

Don J. Corrigall, and William D. Oldershaw, both of Appleton, Wis., assignors to Miller Electric Manufacturing Company, Appleton, Wis.

Filed May 23, 1969, Ser. No. 827,288
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 5 Claims

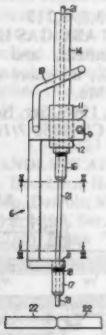


A gas arc welding torch in which the nozzle is made of anodized aluminum and the contact tube is clad with anodized aluminum to prevent the sticking of weld spatter to these parts.

3,590,213
ARC STARTING DEVICE FOR LONG ELECTRICAL STICKOUT ARC WELDING

Robert A. Caldwell, York, Pa., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Oct. 20, 1969, Ser. No. 867,802
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 1 Claim

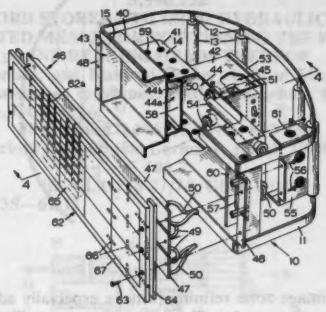


An electrode holder having a pair of axially spaced electrode guides for use in arc welding. The electrode passes through these guides or tips and makes electrical contact with each tip. Means are provided to selectively direct electrical current to one or both of the tips. The tip closest to the work is connected in the electrical circuit to provide current to the electrode at a point adjacent to the workpiece to initiate the arc. Once the arc is started, this tip is isolated from the electrical circuit, and the current is provided to the electrode through the tip remote from the workpiece to permit long electrical stickout arc welding.

3,590,214
PAINT SOFTENER

Paul R. Kuzyk, 106 Lake Street, Saint Catherine, Ontario, Canada

Continuation-in-part of application Ser. No. 715,658, Mar. 25, 1968, now abandoned. This application June 2, 1969, Ser. No. 829,514
Int. Cl. H05b *3/02*; D06f *75/36*
U.S. Cl. 219—228 4 Claims

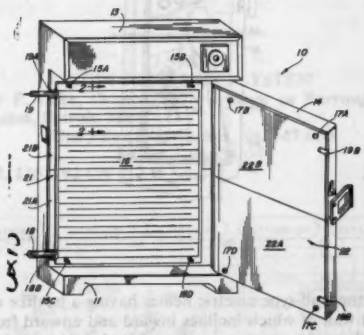


A device for use in removing paint from a surface, in which an electrical heating element is brought into proximity with the pain. The heating element is mounted in one chamber immediately adjacent a plate forming a wall of the chamber. Two additional chambers are located sequentially between the first chamber and hand-gripping means, the two additional chambers having lateral ventilation apertures to dissipate the heat from the element.

3,590,215
CLINICAL FLUID WARMER

Cleophas E. Anderson; Darrie D. Moore, and William J. Walsh, all of Dubuque, Iowa, assignors to Thermolyne Corporation, Dubuque, Iowa

Filed Mar. 27, 1969, Ser. No. 810,976
Int. Cl. A61j *1/00*; F24h *1/20*; H05b *1/02*
U.S. Cl. 219—298 7 Claims

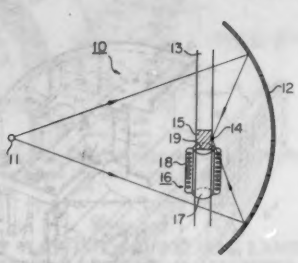


A dry heat clinical blood warmer comprising first and second heater plates, pivotally mounted relative to each other; a thin, flat, channeled sac, having an inlet and an outlet spaced from each other, is mounted between the plates, the sac contacting both plates when the plates are closed. The electrical heater elements for the plates are effectively tapered, by positioning or by power relationships, from inlet end to outlet end, in proportion to the diminishing rate of heat absorption of blood or other fluid flowing through the sac.

3,590,216
ARC-IMAGE ZONE REFINING FURNACE

Yoshihiro Kino, and Yasuhiko Nakayama, both of Kadoma, Osaka, Japan, assignors to Matsushita Electric Industrial Limited, Osaka, Japan

Filed Sept. 15, 1969, Ser. No. 857,840
Int. Cl. H05b 11/00
U.S. Cl. 219—349 4 Claims

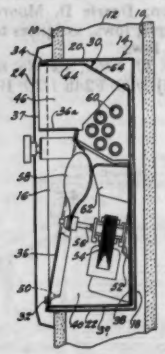


An arc-image zone refining furnace especially adapted for purification of ceramics. The furnace has an auxiliary heating means to effectively prevent a bar of the material to be purified from being cracked due to steep temperature gradients in the solid-liquid interface.

3,590,217
WALL-MOUNTED HEATER

Robert E. Steiner, Creve Coeur, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 2, 1970, Ser. No. 124
Int. Cl. F24h 3/04; H05b 1/00
U.S. Cl. 219—370 5 Claims

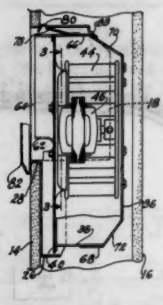


An in the wall-type electric heater having a boxlike casing, the front wall of which inclines inward and upward from the bottom thereof a greater portion of its height and then extends horizontally outward, thereby forming a chamber diminishing upwardly in depth with a horizontally elongated outlet at the top; the heater further including an axial flow fan mounted in a central opening in the inclined front wall with its axis perpendicular to the wall and horizontally extending electric heaters positioned in the upper constricted portion of the chamber. Air drawn into the chamber by the axial flow fan is directed downward at an acute angle toward the lower larger part of the chamber, effecting its horizontal dispersion and, therefore, a more uniform distribution thereof as it passes upward over the horizontally extending heaters and through the horizontally elongated outlet.

3,590,218
WALL MOUNTED HEATER

Robert E. Steiner, Creve Coeur, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 2, 1970, Ser. No. 331
Int. Cl. F24h 3/04; H05b 1/00
U.S. Cl. 219—370 7 Claims

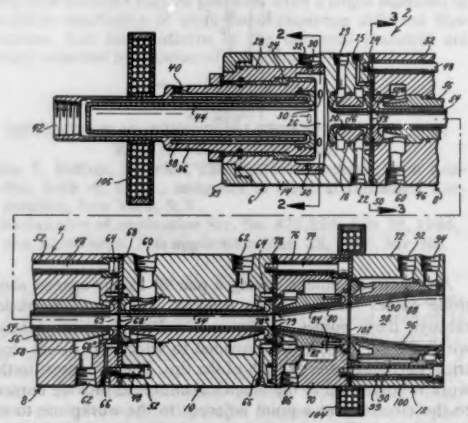


A forced air electric space heater construction permitting convenient entry and mounting thereof within a wall, or the removal therefrom, through a rectangular wall opening of considerable smaller vertical dimension than that of the heater. A one-piece rectangular open mounting frame having deep top and sidewalls and a relatively shallow bottom wall is inserted into a hollow wall structure through a rectangular opening therein. A casing of considerably greater height but sufficiently less width and depth than the frame opening, whereby entry of the casing into the frame while in tilted position is permitted, houses electric heating elements, a blower and duct means having an air inlet and an air outlet in horizontal spaced relationship in the upper portion of the casing front wall. The casing and frame are provided with cooperable pivot means which engage and disengage, respectively, as the casing is entered into or withdrawn from the frame while in tilted position. Releasable latch means are provided to hold the casing in vertical position in the casing. A removable grille covers the wall opening.

3,590,219
ELECTRIC ARC GAS HEATER

James H. Painter, Winfield, and Ronald J. Ehmsen, Bridgeton, both of, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 27, 1969, Ser. No. 802,980
Int. Cl. H05b 7/18
U.S. Cl. 219—383 11 Claims



An electric arc gas heater having a housing provided with a chamber, an expansion nozzle and a constricted throat inter-

connecting the chamber and the expansion nozzle. A hollow upstream electrode opens into the chamber in rearwardly spaced relation to the throat and a portion of the expansion nozzle wall serves as the downstream electrode so that an arc passes completely through the throat.

3,590,220

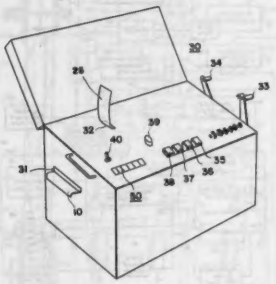
APPARATUS FOR DETERMINING THE AMOUNT OF A PRODUCT CONSUMED BETWEEN TWO TIME PERIODS

Minoru Ishida, Yokohama; Junichi Baba, Kobe, and Toshihiro Shibataki, Kobe, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Cheyoda-ku, Tokyo, Japan

Filed Sept. 27, 1967, Ser. No. 671,018

Int. Cl. B67d *5/06;* **G06k** *1/12*

U.S. Cl. 235—61.9 **11 Claims**



The disclosed device comprises a readout unit for reading out the last consumption of electric power recorded on each card, a register unit for registering the new consumption of power, a computer circuit for computing a difference between the output from the read unit and the registered amount, another computer circuit for computing a rate for that difference, and a display unit for displaying at least one of the outputs of both circuits. One card for each customer recorded with at least the last consumption of power is inserted into the device and is successively recorded with the new consumption of power registered by the register unit, the above-mentioned difference of power, the rate for the consumption differential, etc. by the operation of a recording and a feeding units involved. Also another record medium or a customer receipt can be simultaneously prepared. The recorded cards are supplied to a data processing apparatus.

3,590,221

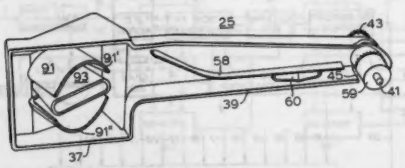
TAPE-HANDLING APPARATUS

Bernard J. Malkowski, Dearborn Heights, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 15, 1967, Ser. No. 638,255

Int. Cl. B65h *17/48;* **G06k** *7/06;* **G03b** *21/04*

U.S. Cl. 235—61.11 R **23 Claims**



Apparatus insertable in and cooperable with a perforated tape reader for providing an improved supply and takeup path for guiding a length of tape past a sensing station in either a self-threading or endless loop mode. In accordance with the first embodiment of this invention channel members in a cartridge frame define input and output paths for guiding tape in a self-threading fashion into feeding relationship with a feed sprocket which transports the tape past a sensing station. In accordance with the second embodiment of this invention, an endless loop tape cartridge including a closed, angularly disposed bin and transport path provided protected storage for the tape when it is not in use and protected transport for it when it is being fed past a sensing station. Tape from the endless loop stored in the bin in helical form is fed along a predetermined transport path past a tape sprocket which controls the feeding of tape from the inter loop past the sensing station and on to the outer loop of the tape mass.

3,590,222

RECORD STORER UTILIZING HYDRAULICALLY ACTUATED MEANS FOR POSITIONING THE WRITING AND READING HEADS THEREOF

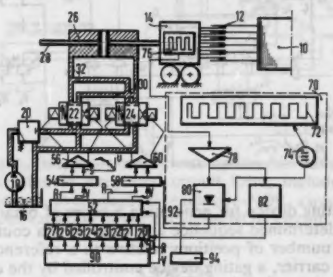
Peter Wentzel, and Manfred Becker, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 27, 1969, Ser. No. 837,150

Claims priority, application Germany, July 3, 1968, P 17 74 502.7

Int. Cl. G11b *21/10;* **G06k** *9/04*

U.S. Cl. 235—61.11 **6 Claims**



A record storer with selective control of the positioning or setting of the writing and reading heads thereof relative to the recording tracks of the recording carriers thereof, in which movement of such heads is effected by a linear hydraulic motor, with the flow of the hydraulic fluid to such motor being controlled through valves with variable flow characteristics, rough adjustment being effected by fluid flow through a first or through such a first and a second valve as a function of the difference between the actual position and the desired position, and fine adjustment being effected by fluid flow through said second valve in correspondence to the distance of the recording and reading heads from the desired track.

3,590,223

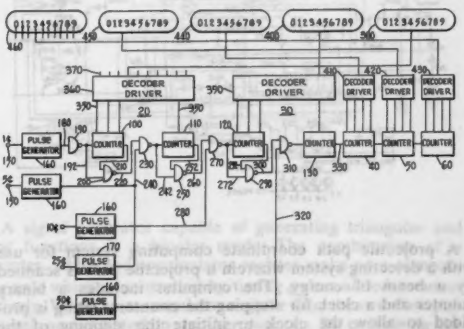
COIN TOTALIZING SYSTEM

Arthur F. Cake, Orange, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 18, 1968, Ser. No. 747,035

Int. Cl. G06m *5/08*

U.S. Cl. 235—92 CN **2 Claims**



The system comprises a pair of binary counters set up to count up to 10 cents and a pair of binary counters set up to

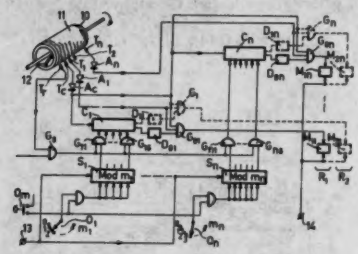
count up to 99 cents and a plurality of binary counters set up to count dollars, tens of dollars, hundreds of dollars, etc. Each pair of counters provides a binary-decimal output which is decoded and fed into a display device to provide a continuous total of money deposited.

3,590,224

DEVICE FOR GENERATING A SERIES F J OF BINARY NUMBERS

Bengt Roland Forsberg, Jakobsberg, Sweden, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Sept. 25, 1968, Ser. No. 762,592
Claims priority, application Sweden, Sept. 29, 1967, 13378/67
Int. Cl. G06m *3/02*
U.S. Cl. 235—92 **6 Claims**



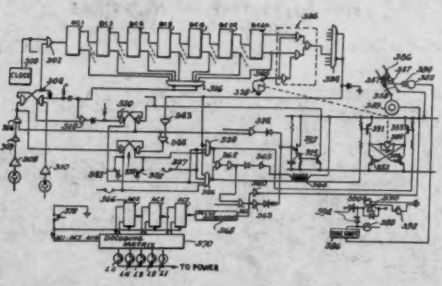
A generating device for generating a series of binary numbers in predetermined sequence and employing a counter for counting a number of positions relative to a reference position on the carrier, a gating device controlled by the counter for opening the gating device at a particular counter position such that the particular position will be transmitted to a memory, the memory providing a plurality of stored positions, scanning of the carrier being affected with a speed such that at least one complete scan of the carrier is affected for each memory cycle readout, the memory then providing a control signal to the counter such that the counting means will produce a gating pulse to the gate at the pulsing of the next following position in the displacement cycle.

3,590,225

DIGITAL ARROW LOCATION COMPUTER

Patrick J. Murphy, Muskegon, Mich., assignor to Brunswick Corporation

Filed Feb. 14, 1969, Ser. No. 799,451
Int. Cl. G06m *1/272*
U.S. Cl. 235—92 GA **13 Claims**



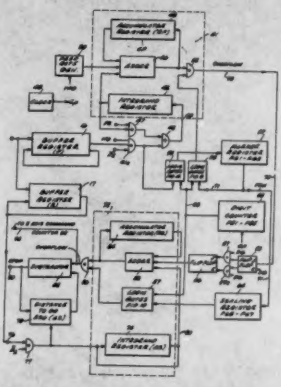
A projectile path coordinate computing system for use with a detecting system wherein a projectile path is scanned by a beam of energy. The computer includes a binary counter and a clock for stepping the counter. Gating is provided to allow the clock to initiate the stepping of the counter at the initiation of the scan of the projectile path and means are provided for stopping the counter when the beam of energy is interrupted during its scan by a projectile so that the count in the binary counter when stopped is indicative of one coordinate of the position of the projectile within the scanned path. Means are also provided for translating the count into an indication of the coordinate of the projectile within the path.

3,590,226

MACHINE TOOL CONTROL SYSTEM

Claude A. Lane, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 10, 1968, Ser. No. 735,754
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.11 **28 Claims**



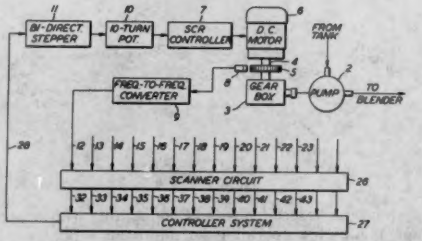
A contour cutting machine tool electrical control system is described which includes a digital integrator having a counting circuit coupled to register the value of the feed rate number and including logic circuitry responsive to the counting circuit for adjusting the value of the output of the accumulator register inversely proportional to the value of the feed rate number.

3,590,227

METHOD AND APPARATUS FOR DIGITAL MEASURMENT AND CONTROL OF A MATERIAL BLENDING OPERATION

Lawrence C. Porter, Palos Verdes Peninsula, and Kenneth E. Graves, Saratoga, both of, Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of application Ser. No. 701,596, Jan. 30, 1968, now Patent No. 3,464,217. This application May 31, 1968, Ser. No. 733,712
Int. Cl. G06p *15/46*
U.S. Cl. 235—151.12 **55 Claims**



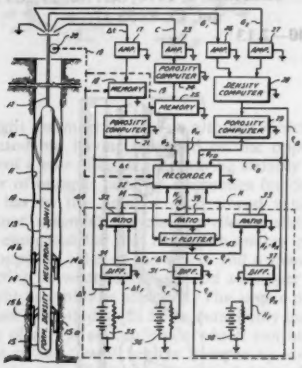
This invention includes digital control methods and apparatus for measuring a plurality of different operating parameters of a system or process, and for adjusting each of these parameters according to a preselected formulation. A scanner circuit may be employed to sequentially sample each

of a plurality of measurement frequencies, and a function of each sample may be compared with a predetermined value to derive a suitable correction.

3,590,228
METHODS AND APPARATUS FOR PROCESSING WELL LOGGING DATA

Jack A. Burke, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 2, 1967, Ser. No. 672,267
Int. Cl. G01v *1/28*
U.S. Cl. 235—151.35 **22 Claims**

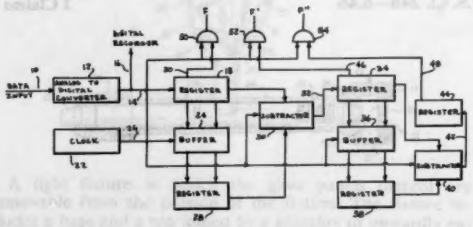


The particular embodiments described herein as illustrative of the invention describe a technique for processing well-logging measurements to provide more meaningful information as to earth formation conditions. In this regard, measurements of sonic travel time, bulk density, and neutron derived porosity of the earth formations are combined to provide certain lithology indices. These lithology indices are then utilized to identify the major lithological constituents of any given formation. Once the major lithological constituents are identified, the percentages of the lithological constituents and porosity of a formation can be accurately calculated.

3,590,229
DIGITAL DIFFERENTIATOR

Johnny M. Humphreys, Houston, Tex., assignor to Electronics Laboratories, Inc., Houston, Tex.

Filed Mar. 28, 1968, Ser. No. 716,853
Int. Cl. G06f *1/02, 7/38, 15/34*
U.S. Cl. 235—152 **5 Claims**

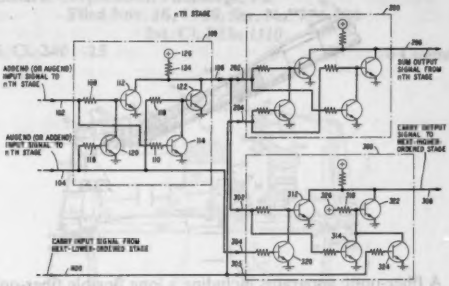


For use with a data source furnishing data repetitively in digital form, apparatus which furnishes the value, first derivative, and second derivative of the data. A clock determines the rate of operation, or Δt. A first and then second value is stored and the difference represents the derivative. On repeating this, a second derivative is obtained. For the shortest representation, the difference signals are only the sign bit of the subtracted values.

3,590,230
FULL ADDER EMPLOYING EXCLUSIVE-NOR CIRCUITRY

Walter R. Nordquist, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 3, 1969, Ser. No. 813,213
Int. Cl. G06f *7/50*; H03k *19/32*
U.S. Cl. 235—176 **5 Claims**

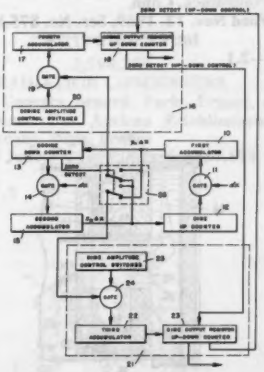


A simple, fast, low-power-consumption full adder, suitable for fabrication in integrated circuit form, includes in each stage thereof two identical exclusive-NOR circuits and a three-input variation of the exclusive-NOR circuit.

3,590,231
DIGITAL SIGNAL GENERATOR USING DIGITAL DIFFERENTIAL ANALYZER TECHNIQUES

Bernard P. Wenzl, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 28, 1969, Ser. No. 819,874
Int. Cl. G06g *7/26*; G06j *1/02*
U.S. Cl. 235—197 **2 Claims**

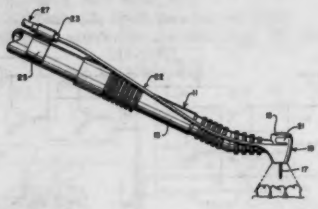


A signal generator capable of generating triangular and sine functions in a bipolar mode. The combination of a counter, adder and accumulator register make up a computing unit which is controlled by timing pulses added accumulatively. When an accumulator register fills, the overflow pulses are accumulated in another register. By combining the outputs of the various registers, the desired functions are produced.

3,590,232
ANNULAR ILLUMINATOR FOR DENTAL TOOLS OR THE LIKE

Henry B. W. Sadowski, Plainview, N.Y., assignor to Radioptics, Inc., Plainview, N.Y.

Filed Mar. 27, 1968, Ser. No. 716,591
Int. Cl. F21v *33/00*; A61c *3/00*
U.S. Cl. 240—2 10 Claims

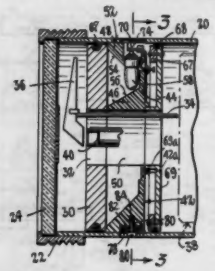


A fiber-optic apparatus including a long flexible fiber-optic light guide formed of a bundle of transparent fibers of glass or synthetic resin material. One end of the bundle of fibers is intensely illuminated by a projection lamp and suitable optics for concentrating light on the end of the bundle, and the other end of the bundle of fibers is spread and shaped into an annular configuration arranged so that the cones of light from the individual fibers overlap to provide substantially uniform illumination of an area about equal to or somewhat greater than the area within the annulus at a predetermined working distance from the ends of the fibers. A method of manufacturing the annular configuration includes shaping fibers on a mandrel, retaining them with rings and securing them with adhesive before serving the fibers at one ring to form the annular output end.

3,590,233
REMOVABLE AND REPLACEABLE INSTURMENT LAMPS

Doandl E. Protzmann, Litchfield, and Edmund F. Zawacki, Naugatuck, both of Conn., assignors to Lewis Engineering Company, Naugatuck, Conn.

Filed Nov. 12, 1969, Ser. No. 875,872
Int. Cl. G01d *11/28*
U.S. Cl. 240—2.1 7 Claims



An indicating instrument having electric lamps disposed behind the dial and pointer, for illuminating the same. The lamps are demountably carried in an annular reflector the periphery of which extends along the inside wall of the cylindrical instrument casing. Lamp removal from the reflector is in outward directions through openings in the reflector periphery. The instrument casing is provided with corresponding or aligned access openings whereby lamp servicing can be performed without removing the annular reflector. A shallow, wide groove is provided in the casing exterior, communicating with the access openings and normally accommodating a removable cover band which closed over the openings so that the casing has a closed exterior appearance.

3,590,234
KEYHOLE-ILLUMINATING DEVICE WITH TIME DELAY

Alfred M. Bartick, 28 Redwood Street, Anaheim, Calif.

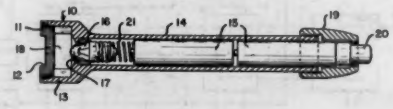
Filed Mar. 6, 1970, Ser. No. 17,203
Int. Cl. E05b *17/10*
U.S. Cl. 240—2.13 3 Claims

A keyhole-illuminating device comprising a casing having an opening at one end. An illuminating element mounted in said casing on extending enteriorly of said opening for directing light toward a keyhole. A battery is mounted in said casing and connected in a series circuit with said illuminating element. A vacuum cup time delay pushbutton actuator including an electrical contact member for temporarily energizing said circuit.

3,590,235
BRAKE CUP TOOL

Paul R. Leo, 1008 Rutgers Drive, Allison Park, Pa., and Lorenzo L. Fowler, 1935 Melvina Street, Pittsburgh, Pa.

Filed July 7, 1969, Ser. No. 839,477
Int. Cl. B43k *29/10*; F21v *33/00*; B25b *13/06*
U.S. Cl. 240—6.46 2 Claims

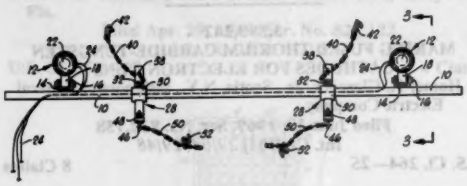


A brake cup tool is provided having a generally cylindrical head, a frustoconical opening in one end of said head adapted to frictionally engage a brake cup, a yoke connecting said head to an elongated axially extending handle whereby openings are provided for visibility within the head. The handle is a hollow tubular member receiving electrical batteries and carrying a lamp in an axial opening in the end adjacent the yoke. A switch is provided on the body, preferably at the end opposite the yoke.

3,590,236
TOWING LIGHT ASSEMBLY FOR USE ON A TOWED VEHICLE

Abner E. Ussery, 2500 S.W. 58th St., Oklahoma City, Okla.

Filed July 15, 1968, Ser. No. 744,794
Int. Cl. B60q 7/00; B60d 1/00
U.S. Cl. 240—7.1 1 Claim



A towing light assembly for use on a towed vehicle including an elongated bar having mounted on the opposite end portions thereof a pair of lights, and having slidably mounted thereon a pair of bumper fastener assemblies for detachably securing the bar to the bumper of a towed vehicle. The bumper fastener assemblies include a sleeve slidably surrounding the elongated bar and having an anchor plate projecting from opposite sides of the sleeve and a spacer subassembly projecting between the sleeve and a bumper to which the towing light assembly is attached. The upper portion of the anchor plate is slotted so as to be detachably engageable with the links of a first anchor chain which can be hooked over one edge of the towed vehicle bumper by means of a suitable hook element. The lower portion of the anchor plate carries a locknut and eyebolt to which is attached one end of a chain which is detachably connected to a bent-bar bumper-engaging member.

3,590,237
LIGHT FIXTURE WITH REMOVABLE GLASS PANELS

Mellie E. Winters, and Perry E. Proctor, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

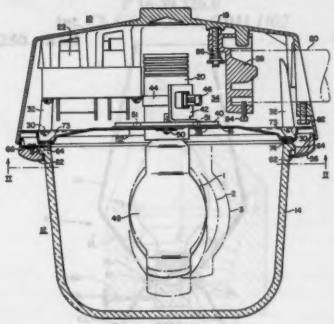
Filed July 25, 1968, Ser. No. 747,663
Int. Cl. F21l 7/00, 15/00
U.S. Cl. 240—11.2 13 Claims

A light fixture in which the glass panels thereof are removable from the outside of the fixture. The fixture includes a base and a top joined by a plurality of upwardly extending cornerposts. The base includes panel-receiving channels which extend between the cornerposts and which are somewhat wider than the thickness of the panel. The bottom of each panel is received in a channel and the inner surface of the panel is held against retaining flanges on the cornerposts by a spring clip secured to the top of the fixture. The retaining flanges are spaced from the front wall of the channel a distance approximately equal to the thickness of the panel and the panel is held in a secure, substantially rattle-free condition by the spring clip. The cornerposts diverge upwardly and outwardly from the base, and when the spring clip is released, the weight of the panel causes the top of the panel to pivot outwardly away from the light fixture. The panel-receiving channel permits limited pivotal movement of the panel and holds the panel against further movement. The panel may then be readily lifted out of the channel.

3,590,238
STREET-LIGHTING LUMINAIRE

John B. Arens, Cleveland, Ohio, assignor to Westinghouse Electric Corporation, Pittsburge, Pa.

Filed Nov. 18, 1968, Ser. No. 776,489
Int. Cl. F21s 1/10
U.S. Cl. 240—25 6 Claims

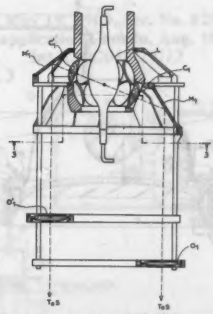


A street-lighting luminaire having an enclosed optical system adapted for containing a vertically burning mercury vapor lamp. The luminaire includes an overhead housing assembly separated by a dish-shaped reflector from a downwardly depending sealed optical assembly. A ballast assembly, socket mounting and positioning assembly and luminaire mounting bracket are located within the overhead housing assembly. The socket mounting and positioning assembly is mounted on the reflector within the overhead housing assembly and is constructed and arranged to provide for the horizontal and vertical adjustable repositioning of a lamp socket which is mounted on the lamp mounting and positioning assembly and which extends, through an aperture centrally located in the reflector, into the sealed optical assembly.

3,590,239
RADIATION CONDENSERS

Christian Louis Georges Benard, Paris, France, assignor to Societe Parisienne Des Anciens Etablissments Barbier Bernard A Turenne, Paris, France

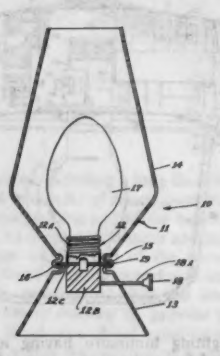
Filed June 17, 1968, Ser. No. 737,614
F21v 13/04
U.S. Cl. 240—41.3 5 Claims



A radiation condenser device enabling irradiated surfaces to be lighted uniformly, for instance intended for solar simu-

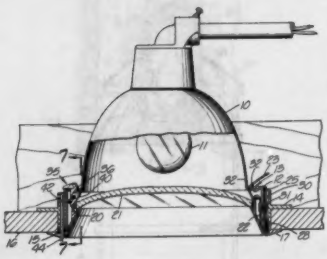
lation, comprising two rings centered on the optical axis around one light source and having an equal number of elementary condenser devices each comprising a condenser lens, a planar mirror and an objective lens so that all the images of said elementary devices coincide, whereby the irradiated surface is uniformly lighted.

3,590,240
ELECTRIC LIGHT FIXTURE
Arnold M. Miller, Jamaica, N.Y., assignor to A-Bee Syndicate, Inc., New York, N.Y.
Filed Dec. 19, 1968, Ser. No. 785,096
Int. Cl. F21s 1/12
U.S. Cl. 240—81 8 Claims



This disclosure is directed to an electric lamp having a socket and connected switch housing electrically insulated, one from the other, wherein the combined socket and switch member is detachably connected to the lamp base or fixture. The combined socket and switch housing is detachably connected to the fixture by means of a laterally extending flange which is adapted to be snap fitted into a complementary groove formed on the fixture.

3,590,241
LIGHTING FIXTURE
Peter J. Docimo, Northridge, and Kenneth T. Urpin, Los Angeles, both of, Calif., assignors to Marvin Electric Manufacturing Company, Los Angeles, Calif.
Filed July 1, 1968, Ser. No. 741,379
Int. Cl. F21v 17/00
U.S. Cl. 240—147 6 Claims

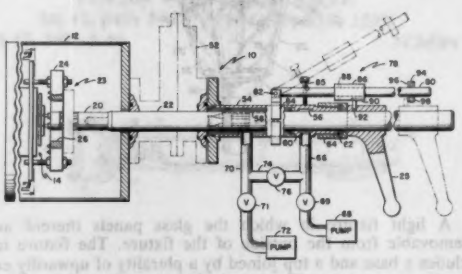


A circular recessed lighting fixture in which the faceplate is hingedly mounted on a vertically movable member which is received in the fixture framework. When the faceplate is unlatched, the member moves downward in the framework to permit downward movement of the faceplate before pivotal movement of the faceplate about the hinge begins. A camming surface is provided for moving the vertically movable member back into the framework when the faceplate is pivoted back toward the horizontal position. A latch is provided which can be operated either by forcing the diffuser upward in the faceplate or by depressing a lever independent of the faceplate.

3,590,242
MAKING FUSED THORIUM CARBIDE-TUNGSTEN CATHODES FOR ELECTRON GUNS
Homer H. Glascock, Jr., Scotia, N.Y., assignors to General Electric Company
Filed June 12, 1969, Ser. No. 832,758
Int. Cl. H01j 29/04, 29/48
U.S. Cl. 264—25 8 Claims

The surface energy of a liquid phase of thorium compounds or alloys is used in fabricating cathodes by immersing the lower end of an inclined refractory metal tube into a powder mixture of elemental thorium and tungsten carbide, heating to a temperature above the melting point of the mixture so that the liquid mixture flows up the inside of the tube by capillary attraction, cooling and cutting the tube into sections of length for cathode bodies. A convex hemispherical emissive surface for the thermionic cathode is formed by electron beam melting the end of the thin rod of a thorium compound or alloy.

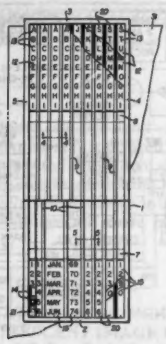
3,590,243
SAMPLE INSERTION VACUUM LOCK AND PROBE ASSEMBLY FOR MASS SPECTROMETERS
Richard E. Perrin, and Billy A. Hopper, both of Tulsa, Okla., assignors to Avco Corp., Tulsa, Okla.
Filed June 30, 1969, Ser. No. 837,549
Int. Cl. H01j 39/34
U.S. Cl. 250—419 S 2 Claims



A sample insertion vacuum lock and probe assembly for use in mass spectrometers is disclosed in which an axially extending sample carrier is mounted for reciprocal movement into and out of an ion chamber. Electrical connection with the sample carrier probe is made through sliding engagement of the probe with an electrical contact support assembly mounted in the ion chamber. A vacuum lock and a vacuum system is provided to insure that the vacuum in the ion

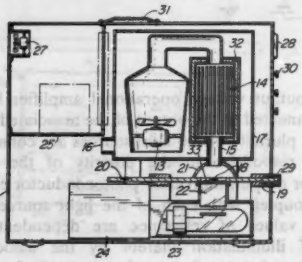
chamber is not disturbed. Mechanical locking means and positioning means are included to prevent accidental destruction of the vacuum and to precisely position the sample within the ion chamber.

3,590,244
MARKER FOR X-RAY FILMS
Donald A. Kullman, 1910 S. State Road Seven, Hollywood, Fla.
Filed Apr. 29, 1969, Ser. No. 820,122
Int. Cl. G03b *41/16*
U.S. Cl. 250—67 **4 Claims**



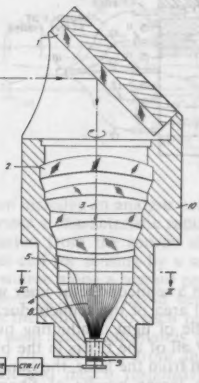
A marking device for x-ray films which comprises a holder or tray having a radio-opaque wall or floor formed with one or more apertures or slot openings, the holder containing a plurality of marker strips bearing radio-opaque indicia such as letters and numerals, and which strips are slidably movable to locate predetermined parts of them in registry with the exposure openings to thereby produce names, dates or other information directly upon the film by the subjection of the selected parts of the marker strips to x-rays at the exposure openings.

3,590,245
METHOD AND INSTRUMENT FOR READING OUT THERMOLUMINESCENCE
Hajimu Oonishi, Sakurai-shi; Osamu Yamamoto, Hirakata-shi; Tadaoki Yamashita, Hirakata-shi; Hidetsugu Kawabata, Nagata-ku, Kobe; Saburo Kitamura, Fushimi-ku, Kyoto, and Yutaka Higashida, Nishinomiya-shi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 18, 1969, Ser. No. 850,705
Claims priority, application Japan, Aug. 20, 1968, 43/60154; 43/60155; 43/60156; 43/60157
Int. Cl. G01t *1/11*
U.S. Cl. 250—71 R **8 Claims**



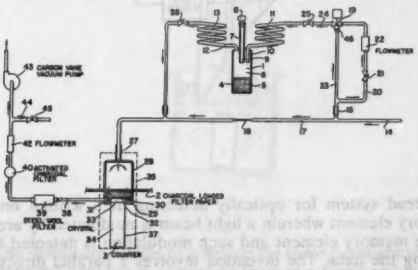
A method of reading out the dosage of radiation to which a dosimeter was previously exposed, by blowing hot air against the exposed dosimeter to heat the same and reading out the dosage of radiation from the thermoluminescence emitted by said heated dosimeter, and an instrument for practicing the above-described method, said method and said instrument being capable of reading out the thermoluminescence of a dosimeter in a simple manner with high reliability and accuracy, irrespective of the shape of dosimeter.

3,590,246
DEVICE FOR MODULATING RADIATION ENERGY AND FOR BUNDLING IT INTO A VERY SMALL SECTION
Franz Menke, Neckargemund, Germany, assignor to Eltro G.m.b.H. & Co., Heidelberg, Germany
Filed Jan. 17, 1969, Ser. No. 791,963
Claims priority, application Germany, Feb. 16, 1968, P 16 39 226.0
Int. Cl. G02b *5/14*; G01j *1/02*
U.S. Cl. 250—83.3 **7 Claims**



The invention provides a modulation device for electromagnetic radiation such as infrared radiation and the like. The modulator itself consists of a plurality of strips separated by slots through which the radiation can pass. This group of strips constitutes a grid which is rotated about an axis and which feeds modulated energy to a radiation-responsive device. Between the grid and radiation responsive device is provided an optical system consisting of a plurality of fibers which at one end are formed in groups corresponding to the aforesaid slots and which at the other end are bundled into a circular arrangement corresponding to the radiation-responsive device.

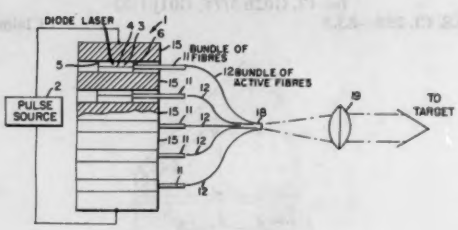
3,590,247
METHOD AND APPARATUS FOR MONITORING A GASEOUS ATMOSPHERE FOR RADIOACTIVE ISOTOPES INCLUDING ORGANIC IODINE COMPOUNDS
Richard Moore Holford, 4 Claremount Road, Deep River, Ontario, Canada
Filed May 19, 1969, Ser. No. 825,751
Claims priority, application Canada, Aug. 19, 1968, 027,816
Int. Cl. G01n *23/12*
U.S. Cl. 250—83.3 **8 Claims**



Air near, for example, a nuclear reactor, is monitored for radioactive isotopes including organic iodine compounds by

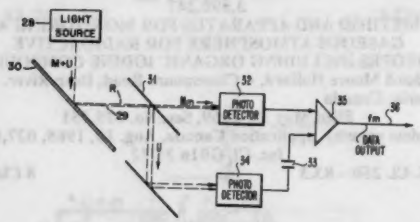
adding a trace addition of fluorine, chlorine or bromine so that the isotopes will be adsorbed by a charcoal-loaded filter paper. The filter paper is then analyzed for radioactivity.

3,590,248
LASER ARRAYS
Edward J. Chatterton, Jr., Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Apr. 13, 1965, Ser. No. 447,734
Int. Cl. H04b 9/00
U.S. Cl. 250—199 **16 Claims**



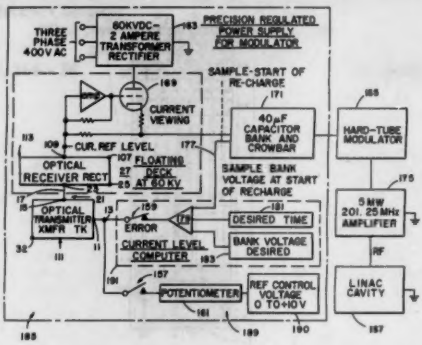
Radiation from a semiconductor laser which radiates from a relatively small area of the semiconductor is directed to a target by a bundle of light conducting tubes or fibers, such that substantially all of the fibers in the bundle actively conduct the radiation from the laser, the bundle being formed by selecting from a larger bundle of fibers which abuts the semiconductor only those fibers which actively conduct the laser radiation.

3,590,249
OPTICAL READ SYSTEM
Melbourne E. Rabedeau, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 2, 1968, Ser. No. 764,473
Int. Cl. H04b 9/00
U.S. Cl. 250—199 **8 Claims**



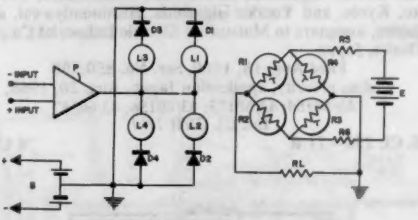
A read system for optically detecting data written on a memory element wherein a light beam is modulated by areas of the memory element and such modulation is detected for reading the data. The invention involves a parallel directed beam, not modulated by the data but utilized for subtracting background noise from the read beam.

3,590,250
VALVE AND PULSE-WIDTH-MODULATED DATA LINK USING INFRARED LIGHT TO CONTROL AND MONITOR POWER SUPPLY FOR MODULATOR FOR HIGH-ENERGY LINEAR ACCELERATOR
Richard L. Witkover, Commack, N.Y., assignor to The United States of America as represented by the United States Atomic Energy Commission
Filed June 6, 1969, Ser. No. 830,970
Int. Cl. H04b 9/00
U.S. Cl. 250—199 **9 Claims**



Method and apparatus for transmitting information across a high-voltage interface by light pulse-width modulation for remotely monitoring, controlling and/or energizing high-voltage apparatus.

3,590,251
OPERATIONAL AMPLIFIER HAVING LIGHT SOURCES AND OPTICALLY COUPLED PHOTOCONDUCTOR ELEMENTS IN OUTPUT CIRCUIT THEREOF
Robert E. Vosteen, 315 W. Center St., Medina, N.Y.
Filed Feb. 28, 1969, Ser. No. 803,252
Int. Cl. H01j 39/12
U.S. Cl. 250—210 **16 Claims**

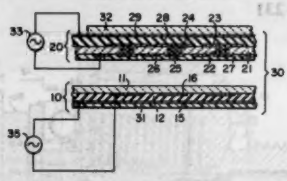


A high output voltage operational amplifier having light sources connected to the output of the associated preamplifier stage. A plurality of the light sources are connected to be selectively responsive to the polarity of the operational preamplifier output. Individual photoconductor elements are optically coupled with each of the light sources and their respective values of resistance are dependent upon the amount of illumination thereof by the associated light sources. The photoconductor elements are electrically isolated from their respective light sources but are optically responsive thereto to provide an output signal that is dependent upon the amplitude and polarity of the output of the operational preamplifier.

3,590,252
LIGHT-SENSITIVE SWITCHING DISPLAY DEVICE

Royston E. W. Lake, Dundas, Ontario, Canada, assignor to Canadian Westinghouse Company, Limited, Hamilton, Ontario, Canada

Filed July 11, 1968, Ser. No. 744,211
Claims priority, application Canada, Nov. 21, 1967, 005,642
Int. Cl. H01l *17/00*; G11b *7/00*
U.S. Cl. 250—213 5 Claims

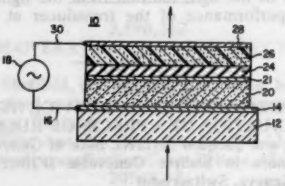


An electroluminescent storage and readout device in which a light-responsive switch is utilized to control an electroluminescent material and in which the light-responsive switch is controlled by a light-generating information system. A high-voltage storage/readout device is optically coupled to a low-voltage electroluminescent drive panel in a two-stage device.

3,590,253
SOLID-STATE PHOTOCONDUCTOR-ELECTROLUMINESCENT IMAGE INTENSIFIER

Michael A. Novice, and Zolian P. J. Szepesi, both of Elmira, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1969, Ser. No. 837,492
Int. Cl. H01j *31/50*
U.S. Cl: 250—213 5 Claims

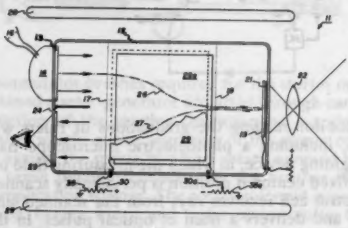


A solid-state photoconductor-electroluminescent intensifier having improved photoconductive layer construction and innerconnection with the electroluminescent layer.

3,590,254
INFRARED IMAGE CONVERTER

Walter Wysoczanski, 4401 Ladera St., San Diego, Calif., and John P. Choisser, 8487 Paseo Del Ocaso, La Jolla, Calif.

Filed Nov. 26, 1969, Ser. No. 880,310
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 4 Claims

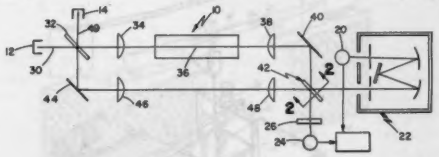


An infrared image converter utilizing a flood beam from a cold photocathode source and a solenoidal focus field from a solenoid completely surrounding the entire flood beam; the flood beam being directed by a static deflection system toward a thermally sensitive target placed at the end of a decelerating zone which forms an electron mirror repelling a portion of the electrons toward a phosphor screen for displaying the image of the infrared pattern on the thermally sensitive target.

3,590,255
ANALYSIS SYSTEM

Stanley B. Smith, Jr., Lexington, and James E. Burnett, Maynard, both of, Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed Feb. 28, 1969, Ser. No. 803,211
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 20 Claims

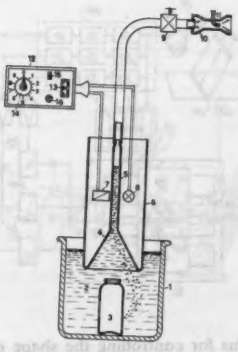


An analysis system includes an analysis cell and a radiation source which generates a characteristic radiation. An optical system passes radiation from the source along a first path through the analysis cell for sensing by a sensor and passes radiation from the source along a second path outside of the analysis cell, for sensing by a second sensor. An optical modulator channels the radiation in each path alternately to the sensors so that each sensor alternately produces an output proportional to the radiation from the corresponding source in each path and means responsive to the optical modulator provides an accurately predetermined portion of the output signal from each sensor in each cycle of the optical modulator.

3,590,256
DEVICE WITH PHOTOELECTRIC BUBBLE INDICATOR FOR THE CHECKING OF GAS-TIGHT CONTAINERS AND THE LIKE BY IMMERSION IN A LIQUID

Teodorico Neeff, 38-20141 Via Gran Sasso, Milan, Italy

Filed July 1, 1969, Ser. No. 838,210
Claims priority, application Italy, Mar. 5, 1969, 13666A/69
Int. Cl. G01h *21/26*
U.S. Cl. 250—218 2 Claims



The disclosure relates to a device for testing gastightness of pressurized containers immerging them in a liquid and counting the bubbles eventually issued from the tested containers.

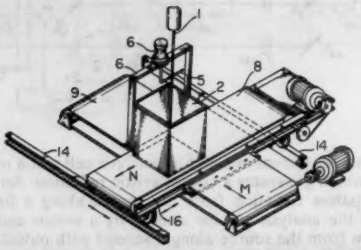
The device essentialy comprises a tank containing a liquid into which is dipped a bell provided with a vertical shaft having at least a transparent portion adapted to be filled by the liquid contained in the tank, said transparent portion of the shaft being placed between a light source and a photocell. The container to be tested is immersed in said liquid and the eventual bubbles issued by it are revealed by the photocell and counted by a correlate counting device.

3,590,257

APPARATUS FOR AUTOMATICALLY REMOVING IRREGULAR YARN

Eitaro Mukai; Yasuhiro Murase; Tosio Sekiya, and Tatsumi Tanabe, all of Ehime-ken, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 4, 1969, Ser. No. 813,512
Claims priority, application Japan, Apr. 12, 1968, 43/24482
Int. Cl. G01b *11/10*
U.S. Cl. 250—219 **3 Claims**



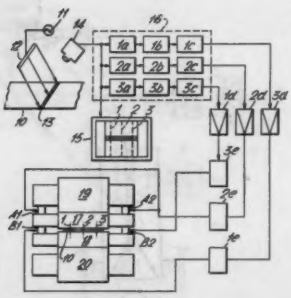
This invention is intended to automatically remove irregular synthetic fiber tow if any when the tow is collected into a container during the fiber production operation and to prevent it from being led to such subsequent processes as drawing or heat setting.

3,590,258

APPARATUS FOR CONTROLLING THE SHAPE OF ROLLED PRODUCT

Hideo Shibata, and Takashi Emori, both of Yokohama-shi, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 5, 1969, Ser. No. 874,322
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 **3 Claims**



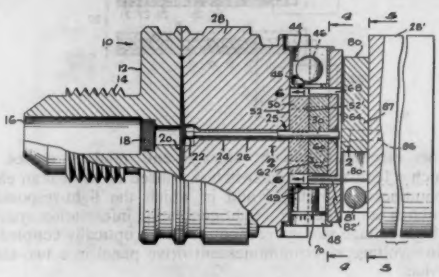
An apparatus for controlling the shape of rolled product characterized in that an image reflected from the surface of the rolled product is detected, that the pressure working on the central and edge portions of the rolling machine is regulated in accordance with the degree of displacement of the image, and that the shape of the rolled product in the process of being rolled is automatically kept uniform.

3,590,259

CHOPPER STABILIZED PHOTOELECTRIC TRANSDUCER

Russel R. Johnston, Los Angeles, Calif., and Louis Bucalos, Holbrook, N.Y., assignors to Kinemotive Corporation, Farmingdale, N.Y.

Continuation of application Ser. No. 623,763, Mar. 16, 1967, now abandoned. This application Apr. 20, 1970, Ser. No. 41,662
Int. Cl. G01d *5/34*
U.S. Cl. 250—231 **15 Claims**



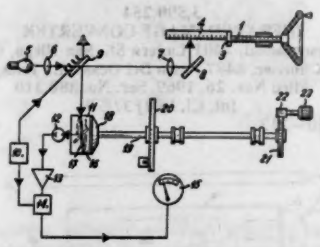
A photoelectric transducer having two paths for light from a single light source to a single photosensor, one path having a shutter coupled to the object whose displacement is to be measured for sensed attenuation of the light in that path, and one path having a chopper mechanism for periodically interrupting the light in that path to provide an AC component. The light from one path causes the photosensor to produce a sensed signal component, while the light from one or both paths causes the photosensor to produce a control signal component or components for use in a control circuit to vary the amplitude of the light emitted from the light source to stabilize the performance of the transducer at a constant value.

3,590,260

HIGH-PRECISION READING DEVICE OF THE GRADUATION OF A PRECISION RULER

Peter Holmes, and Jacques Pettavel, both of Geneva, Switzerland, assignors to Societe Genevoise D'Instruments De Physique, Geneva, Switzerland

Filed May 22, 1967, Ser. No. 640,212
Claims priority, application Switzerland, Aug. 25, 1966, 12,343/66
Int. Cl. G01d *5/34*, *5/36*, *11/10*
U.S. Cl. 250—231 **4 Claims**

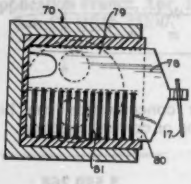


A device for reading the graduations of rulers with high precision, including a photoelectric microscope having an optical sighting device, in which the measuring field on either side of a fixed centered position is periodically scanned and a photoelectric cell receives rays from the scanned surface of the ruler and delivers a train of optical pulses. In the focal plane of the ruler and on the optical path of the microscope, a cylindrical diaphragm is disposed which has a helical slot movable between plural positions corresponding to portions of the measuring field centered on different scale markings of the ruler.

3,590,261
OPTOELECTRIC TRANSDUCERS WHICH UTILIZE A SINGLE LIGHT SOURCE TO PRODUCE BOTH ANALOG AND DIGITAL OUTPUTS

Richard K. Snook, Bridgeton, and John C. Burton, Saint Louis, both of, Mo., assignors to Diginetics Incorporated

Filed Aug. 6, 1969, Ser. No. 847,999
Int. Cl. G01d 5/34; H01j 3/14
U.S. Cl. 250—231 R 17 Claims

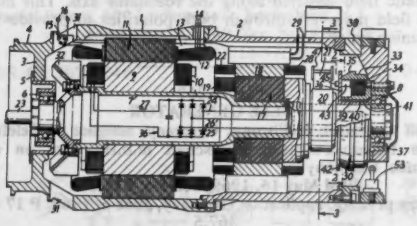


A transducer which measures the change of a measured physical variable such as temperature or pressure, etc. by means of a mechanically actuable element such as a bourdon tube. The mechanically actuable element is connected to and moves a shutter responsive to actuation of the element. The shutter is disposed in light interrupting position between an aligned source of light and a photocell and, therefore, the electrical output is an analog function of the movement of the shutter. A direct reading digital output transducer differs from the analog output transducer in that the shutter is transparent and provided with a diffraction grating, or ronchi ruling or the like which coacts with a stationary diffraction grating located in a plane perpendicular to the path of light. Movement of the shutter produces a Moire pattern on the photocell to produce a digital output.

3,590,262
BRUSH-OPERATING GEAR FOR ELECTRICAL MACHINES

Bernard R. Sheffield, and Frederick R. Jones, both of Ilford, Essex, England, assignors to The Plessey Company Limited, Ilford, Essex, England

Filed Apr. 29, 1969, Ser. No. 820,124
Claims priority, application Great Britain, May 1, 1968, 20545/68
Int. Cl. H02k 23/52
U.S. Cl. 290—46 3 Claims

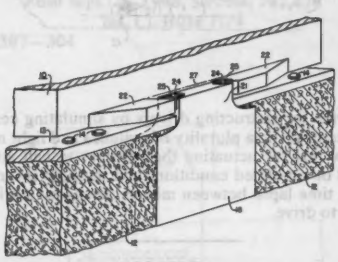


The commutator brushes required for the starter operation of a combined starter-generator are lifted through cam action on completion of the starting operation by a spring-urged ring member which, at the beginning of the starter operation is turned against the spring bias by a rotary solenoid to disengage the brush holders thus allowing the brushes to be applied by application springs. The rotary solenoid is preferably of the type having inner and outer stator poles between which the pole pieces of an annular rotor penetrate, the resulting gaps, or at least one of them, being wedge shaped to maintain throughout the stroke a torque sufficiently high to overcome the progressively loaded return springs, sufficient initial torque being ensured by asymmetric location of the solenoid rotor pole pieces relative to the solenoid stator pole pairs in the deenergized position.

3,590,263
TRANSVERSE ANCHOR ARRANGEMENT FOR A TURBINE POWERPLANT

Thorleif Haug, Cherry Hill, N.J.; Joseph G. Chiarolanza, Philadelphia, Pa.; Peter S. Zeimann, Glen Mills, Pa., and James A. Duncan, Millbrae, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1969, Ser. No. 805,242
Int. Cl. H02k 7/18
U.S. Cl. 290—52 7 Claims

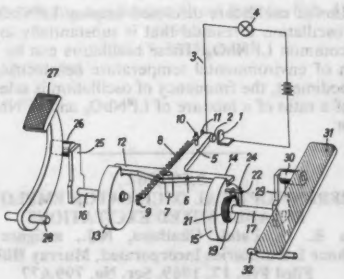


Anchor blocks for a steam turbine in an electric power plant are embedded in a concrete foundation supplied by the customer. The anchor blocks are provided with keying portions utilized to maintain axial and transverse alignment of one or more cylinders or casings of the turbine units and the generator driven by the turbine. After final alignment of the equipment, L-shaped liners are snugly fitted between the keying portions of the anchor blocks and lugs on the turbine casing, also the generator frame.

3,590,264
CONTROL DEVICE FOR THE STOPLIGHT IN A MOTORCAR

Pierre Mathys, rue des Bossons 78-80, Petit-Lancy, (Canton of Geneve), Switzerland

Filed Dec. 20, 1968, Ser. No. 785,701
Claims priority, application Switzerland, Dec. 20, 1967, Feb. 23, 1968, 17,864/67;2,624/68
Int. Cl. H02g 3/00
U.S. Cl. 307—10 6 Claims



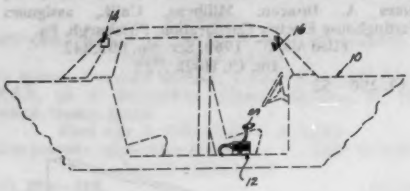
A main switch inserted in the feeding circuit of the stop lamps of the car is closed by a control member responsive to a deceleration of the car either directly by inertia or over the control of the motorcar brake pedal. Opening that main switch is controlled by the accelerator pedal.

3,590,265

INSTRUCTIONAL STIMULATION DEVICE FOR THE TEACHING OF THE BEHIND-THE-WHEEL PHASE OF DRIVER EDUCATION

William D. Richardson, 234 Rounsville St., Waupun, Wis.

Filed Jan. 3, 1969, Ser. No. 788,786
Int. Cl. H02g 3/00
U.S. Cl. 307—10 5 Claims



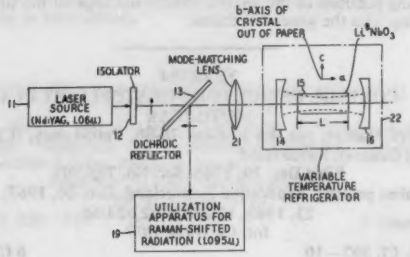
A device for instructing drivers by simulating certain conditions comprising a plurality of switches and light means and a control box for actuating the switches to call attention to changed or simulated conditions and the light means to measure the time lapse between mirror checks by a driver learning how to drive.

3,590,266

RAMAN OSCILLATOR EMPLOYING RARE ISOTOPE

Wilbur D. Johnston, Jr., Middletown, and Ivan P. Kaminow, New Shrewsbury, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 10, 1968, Ser. No. 728,302
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 3 Claims



The Raman oscillators disclosed employ Li^6NbO_3 to provide an oscillation threshold that is substantially lower than for the common Li^7NbO_3. These oscillators can be tuned by variation of environmental temperature or electric field. In one embodiment, the frequency of oscillation is selectable by choice of a ratio of a mixture of Li^6NbO_3 and Li^7NbO_3 in the oscillator.

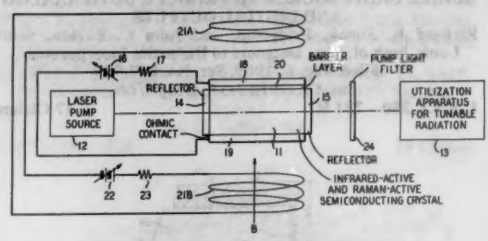
3,590,267

COHERENT OPTICAL OSCILLATOR EMPLOYING TUNABLE MIXED EXCITATIONS

Chandra K. N. Patel, Chatham, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Feb. 17, 1969, Ser. No. 799,677
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 10 Claims

A coherent optical Raman oscillator employing a semiconducting crystal having simultaneously Raman active and infrared-active phonons is disclosed in which mixed excitations called polaritons or plasmaritons scatter light substantially in the forward direction and in which the scattered light is resonated along an axis substantially collinear with the pump propogation and simultaneously is tuned by changing the carrier concentration or an applied magnetic field to maintain the required phase-matching to the pump and the mixed excitation. Carrier concentration can be changed by two-photon absorption or current injection.

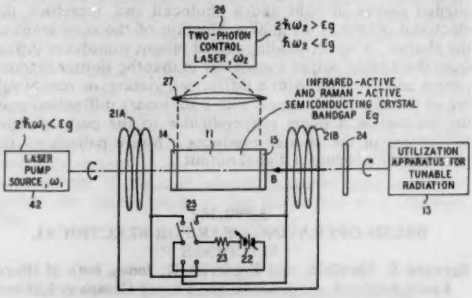


3,590,268

COHERENT OPTICAL OSCILLATOR EMPLOYING TUNABLE MIXED EXCITATIONS

Chandra K. N. Patel, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 27, 1969, Ser. No. 869,649
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 4 Claims


TWO-PHOTON CONTROL LASER, ω_2
$2\hbar\omega_2 > Eg$
$\hbar\omega_2 < Eg$
INFRARED-ACTIVE AND RAMAN-ACTIVE SEMICONDUCTING CRYSTAL BANDGAP Eg
$2\hbar\omega_1 < Eg$
LASER PUMP SOURCE, ω_1
UTILIZATION APPARATUS FOR TUNABLE RADIATION

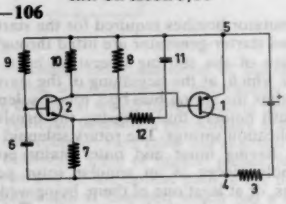
The coherent optical Raman oscillator disclosed employs a semiconducting crystal having simultaneously Raman-active and infrared-active phonons. The oscillator has an optical resonator for the scattered light and is end pumped with intense coherent circularly polarized light. The oscillator is tuned by controlling the charge carrier concentration pertinent to the scattering by injected carriers and by a variable magnetic field directed along the resonator axis. This magnetic field may vary through both polarities to provide the full tuning range.

3,590,269

PULSE GENERATOR

Rudolf Gebhardt, Heilbronn, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm on der Donau, Germany

Filed May 16, 1969, Ser. No. 825,144
Claims priority, application Germany, June 5, 1968, P 17 62 367.5
Int. Cl. H03k 3/00
U.S. Cl. 307—106 12 Claims



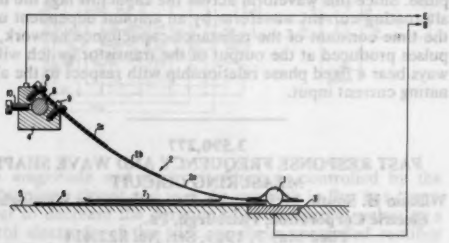
The invention relates to a pulse generator suitable for use in flasher systems and comprising at least two transistors of

opposite polarity having a common load, one transistor which carries the major portion of the load current being controlled by the other transistor, the control current bypassing the load.

3,590,270
SENSING SWITCH

Guy Weber, Dieppe, France, assignor to La Cellophane Societe Anonyme, Paris, France

Filed Apr. 11, 1969, Ser. No. 815,355
Claims priority, application France, Apr. 12, 1968, 147896
Int. Cl. H01h *35/00*
U.S. Cl. 307—119 5 Claims

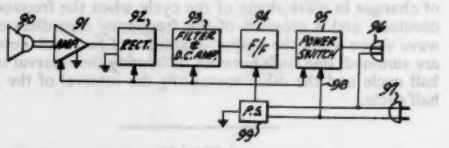


Disclosed herein is a sensing switch assembly for use with copying machines which is highly sensitive to passage of paper or other delicate sheet material and can operate to switch devices employing high electrical current without any sparking to effect the delicate sensing mechanism. Included is a roller element journaled in a spring arm and biased against a contact plate by the action of the spring arm. The spring arm and contact plate are in the loop of an electrical circuit which actuates further switching operations. When a piece of sheet material passes between the roller element and the contact plate, the contact between the element and plate is broken to open a switch in the circuitry. The electrical circuitry includes a transistor and when the switch is open, current is caused to flow from the base to the emitter of the transistor thus causing current to flow from the collector to the emitter of the transistor which operates to switch a large load in the circuitry of the transistor.

3,590,271
REMOTE CONTROL SYSTEM

Daniel Peters, 109 Ludlow Ave., Springlake, N.J.

Filed Apr. 7, 1969, Ser. No. 814,125
Int. Cl. H01h *47/20*
U.S. Cl. 307—140 3 Claims



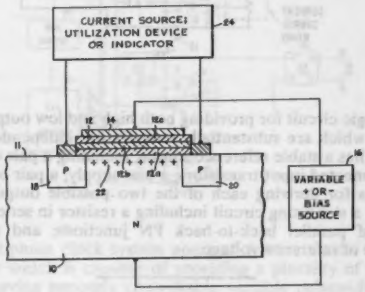
A remote control system employs transmitting and receiving apparatus housed and arranged in configurations which are particularly adaptable for use in a home, dwelling, etc., for eliminating the necessity of extra wiring and outlet boxes.

The transmitting units are mounted in housings resembling conventional wall switchplates normally found in the home; while the receiving units are mounted in housings which resemble normal AC receptacle outlets. The transmitter housings include switching means for selectively activating the transmitter included therein, and causing the same to propagate a predetermined frequency signal which is responded to by a receiving unit mounted in a receiving unit housing coacting with any one of a plurality of existing AC wall mounted receptacles to operate any one of these existing receptacles on a selective basis.

3,590,272
MIS SOLID-STATE MEMORY ELEMENTS UNITIZING STABLE AND REPRODUCIBLE CHARGES IN AN INSULATING LAYER

Belur Venkatachar Keshavan, Laurel, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1968, Ser. No. 762,478
Int. Cl. H01c *7/14*
U.S. Cl. 307—304 6 Claims

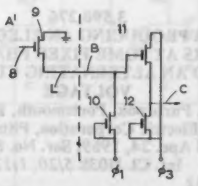


A solid state memory element next provided in an MIS structure. Charges in the insulator layer are reproducibly and stably controlled with respect to bias potential applied across the metal and semiconductor layers. The direction of the bias potential variation is of a polarity to effect turn on of P-channel MIS transistors. In a preferred form the memory element employs as the insulator a first layer of silicon dioxide next to the semiconductor, a layer of silicon nitride, and a second layer of silicon dioxide.

3,590,273
FOUR PHASE LOGIC SYSTEMS

Denis Brian Jarvis, Eastleigh, England, assignor to U.S. Philips Corporation

Filed Feb. 14, 1969, Ser. No. 799,441
Claims priority, application Great Britain, Feb. 15, 1968, 7456/68
Int. Cl. H03k *19/08*
U.S. Cl. 307—205 2 Claims

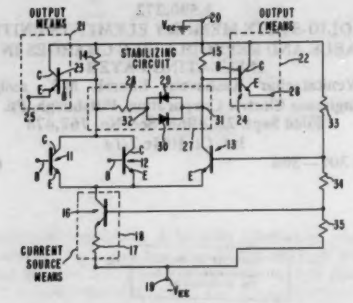


An interface circuit for connecting two chips of a four phase MOST integrated circuit uses four interconnected MOST's switched by the alternate and nonconcurrent pulses of two separate phases of a group of four phase clock signals.

3,590,274
TEMPERATURE COMPENSATED CURRENT-MODE LOGIC CIRCUIT

Robert R. Marley, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Syosset Long Island, N.Y.

Filed July 15, 1969, Ser. No. 841,765
Int. Cl. H03k *19/30, 19/34*
U.S. Cl. 307—215 **20 Claims**

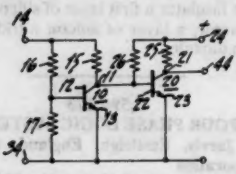


A logic circuit for providing both high and low output logic levels which are substantially temperature independent, and which has a stable reference source, including a pair of parallel-connected input transistors; a bias supply; a pair of output circuits for deriving each of the two possible output signal levels; a stabilizing circuit including a resistor in series with a pair of parallel back-to-back PN junctions; and a stable source of reference voltage.

3,590,275
CONTROL CIRCUITS

Michael S. Fisher, Flemington, N.J., assignor to RCA Corporation

Filed Oct. 11, 1968, Ser. No. 766,777
Int. Cl. H03k *5/20, 17/00*
U.S. Cl. 307—232 **7 Claims**



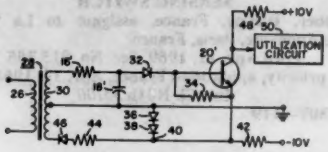
Two transistors, connected in cascade, are arranged to prevent the appearance of an output pulse from a control circuit during positive and negative half cycles of an AC signal source, while permitting the appearance of an output pulse at the zero crossovers of the signal source.

3,590,276
CIRCUIT FOR PRODUCING AN ELECTRICAL PULSE WHICH OCCURS AT SOME FIXED PHASE ANGLE WITH RESPECT TO AN ALTERNATING CURRENT INPUT VOLTAGE

John D. Watson, Purbrook, Portsmouth, England, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 24, 1969, Ser. No. 818,940
Int. Cl. H03k *5/20, 1/12*
U.S. Cl. 307—232 **10 Claims**

Described is apparatus for generating an electrical pulse each time an input alternating current signal passes through a complete 360° cycle, the pulse having a fixed phase angle with respect to the zero crossing starting point of each 360° cycle. This is accomplished by means of a resistance-capacitance network in which the capacitor is connected across the emitter-base junction of a switching transistor. When an alternating current input is applied across the resistance-capacitance network, the capacitor will charge only when the emitter-base junction is reverse biased. When the voltage waveform across the capacitor reaches the zero crossing point, the transistor will fire to produce an output

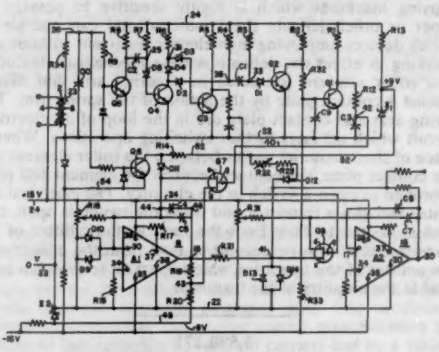


pulse. Since this waveform across the capacitor lags the input alternating current waveform by an amount dependent upon the time constant of the resistance-capacitance network, the pulses produced at the output of the transistor switch will always bear a fixed phase relationship with respect to the alternating current input.

3,590,277
FAST RESPONSE FREQUENCY AND WAVE SHAPE MEASURING CIRCUIT

William H. South, McKeesport, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1969, Ser. No. 822,411
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 **13 Claims**



A measuring network in which a ramp generator is energized throughout each alternate half cycle of the frequency to be measured and in which the ramp generator is reset to an initial potential during each of the intervening half cycles whereby the change in potential of the ramp generator is a measure of the half cycle interval and consequently of the frequency when the wave shape remains constant, a measure of changes in wave shape of the cycle when the frequency is constant, and a measure of the frequency regardless of the wave shape when the output quantities of two such networks are summed; one such network measuring the interval of one half cycle and the other measuring the interval of the other half cycle.

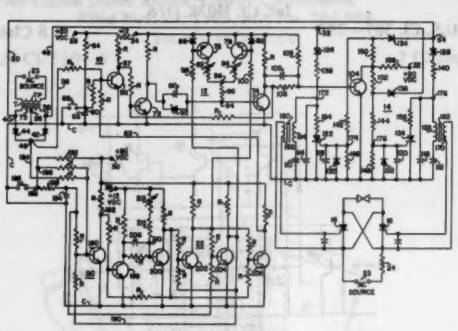
3,590,278
CIRCUIT FOR CONTROLLING CURRENT FLOW THROUGH THE HEAT SEALING UNIT IN A PACKAGING APPARATUS

Dennis Burg, Brown Deer, Wis., assignor to Square D Company, Park Ridge, Ill.

Filed Sept. 15, 1969, Ser. No. 857,865
Int. Cl. H03k *17/00, 17/26*
U.S. Cl. 307—252 **8 Claims**

A circuit for controlling the duration and intensity of current flow through a resistive load, such as a heat sealing ele-

ment in a plastic bag sealing apparatus. The circuit includes an inexpensive circuit for synchronizing the initiation of conduction of a triac or silicon-controlled rectifier with reversals in polarity of an alternating voltage source so that the load is supplied with a series of pulses of current each having the



same magnitude and a circuit which is controlled by the synchronizing circuit and uses the reversals in flux in a transformer to decrease the duration of firing current pulses to a control electrode of the triac or silicon-controlled rectifier from a discharging capacitor.

3,590,279

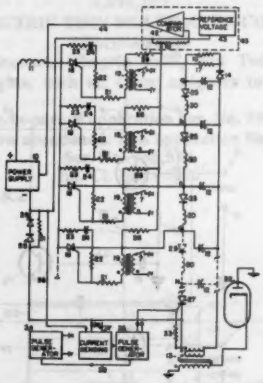
VARIABLE PULSE-WIDTH PULSE-MODULATOR

Bobby J. Thompson, San Jose, and Eugene T. Perusse, W. Corina both of, Calif., assignors to LTV Ling Altec, Inc., Anaheim, Calif.

Continuation-in-part of application Ser. No. 639,744, May 19, 1967, now abandoned. This application Feb. 24, 1970, Ser. No. 13,546

Int. Cl. H03k *1/18*

U.S. Cl. 307—265 **16 Claims**



A solid-state pulse-modulator for producing power output pulses from a source of direct current, the width (duration) of which can be varied on a pulse-to-pulse basis within a given range. This modulator does not employ mechanical switches, such as are normally required for variable pulse-width, high-voltage pulse-modulators. More specifically, a group of parallel-connectable resonant-chargeable networks is provided, each including a capacitor and an inductor. A predetermined number of the chargeable networks are charged by gating into conduction one or more silicon-controlled rectifiers located in the charging path. Still another silicon-controlled rectifier is gated into conduction to discharge all of the charged chargeable networks, to produce an output pulse having a pulse-width proportional to the number of chargeable networks that are so charged and discharged.

3,590,280

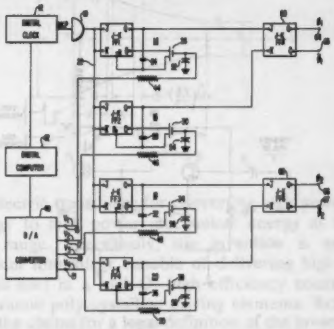
VARIABLE MULTIPHASE CLOCK SYSTEM

James R. Hudson, Perryville, and John C. Spann, Baltimore, both of, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 18, 1969, Ser. No. 877,651

Int. Cl. H03k *5/00, 17/00*

U.S. Cl. 307—269 **10 Claims**



A multiphase clock system operated from a master clock oscillator which is capable of providing a plurality of clock signals having remotely controllable variable pulsewidths as well as mutually variable phase shifts utilizing J–K flip-flop integrated circuit components of the emitter coupled current mode logic type in combination with field effect transistors of the MOSFET type which are operated as voltage controlled variable resistances and suitable timing capacitors for transforming integrated circuit J–K flip-flops into monostable multivibrators.

The invention herein described was made in the course of contract with the Department of the Army under contract No. DAAB–03–67–A–0010.

3,590,281

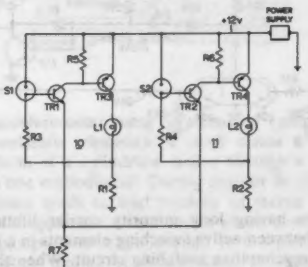
ELECTRONIC LATCHING NETWORKS EMPLOYING ELEMENTS HAVING POSITIVE TEMPERATURE COEFFICIENTS OF RESISTANCE

William G. Russell, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada

Filed July 14, 1969, Ser. No. 841,196

Int. Cl. H03k *3/286*

U.S. Cl. 307—272 **5 Claims**



An electronic latching network has two or more groups of transistors. In each group there is an element, such as an in-

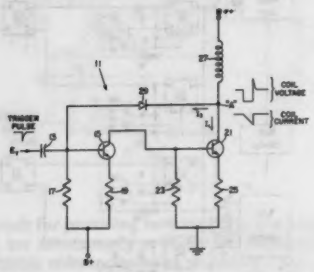
candescent lamp, having a positive temperature coefficient of resistance, and this characteristic is used to ensure that when one group of transistors is turned on, the transistors of all other groups are turned off.

3,590,282

BLOCKING OSCILLATOR

Raphael F. Ehat, Daly City, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 25, 1969, Ser. No. 810,266
Int. Cl. H03k *3/28*
U.S. Cl. 331—273 **4 Claims**



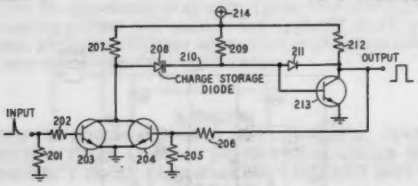
A blocking oscillator having a two stage amplifier feeding a two terminal inductive load. The blocking oscillator has a positive feedback, operative during the active period of the circuit, through a diode connected between the first and second amplifier stages. A load coil or inductance is connected to the output of the second stage. The circuit is initiated by the input pulse and is terminated by the maximum current increase in the load coil which inhibits the positive feedback and therefore turns off the first and the second stages.

3,590,283

REGENERATIVE SWITCHING CIRCUITS EMPLOYING CHARGE STORAGE DIODES

Philip M. Carmody, Roselle Park, and William C. Slemmer, Chatham, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 15, 1969, Ser. No. 824,992
Int. Cl. H03k *3/26, 3/33*
U.S. Cl. 307—273 **14 Claims**



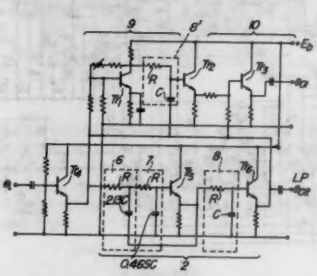
Diodes having long minority carrier lifetimes are connected between active switching elements in a monostable or astable regenerative switching circuit. When the circuit is in one state, a forward current flows through the diode, and charge is stored near the junction thereof. When the circuit is triggered to its other state, current through the diode is reversed and the diode acts as a voltage clamp to maintain one of the switching elements in a nonconductive state.

3,590,284

FILTER CIRCUIT

Masami Yamane, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 8, 1968, Ser. No. 711,770
Claims priority, application Japan, Mar. 10, 1967, 42/14711;42/14712
Int. Cl. H03k *1/16*
U.S. Cl. 307—295 **8 Claims**



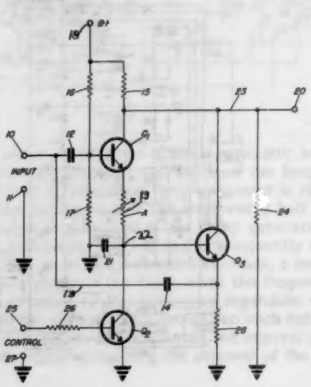
A filter circuit comprising a low (or high)-pass filter having a third order transfer function and a phase shifter having a first order transfer function. An output of the phase shelter is subtracted (added) by a subtractor (adder) from (to) an output of the low (high)-pass filter, whereby a desired third order transfer function equivalent to that of a high (low)-pass filter is obtained as a transfer function between an input of the filter circuit and an output of the subtractor (adder).

3,590,285

VOLTAGE CONTROLLED PHASE SHIFT NETWORK

Atwood H. Hargrove, Baltimore, Md., assignor to The Bendix Corporation

Filed Mar. 6, 1969, Ser. No. 805,054
Int. Cl. H03k *17/00*
U.S. Cl. 307—295 **4 Claims**



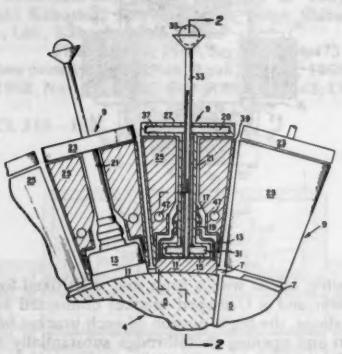
A circuit for selectively reversing an input signal by 180° s described. The input signal, which can be a pulse train or a continuously varying signal is applied to an input terminal. A control voltage is applied to a control terminal. When the control voltage is zero the input signal is amplified but does not undergo a phase shift. When a positive voltage is applied to the control terminal the input signal is amplified and also undergoes a 180° phase shift. The phase of the output signal can therefore be varied by switching the control voltage on and off.

3,590,286

THERMIONIC CONVERTER CELLS FOR NUCLEAR REACTOR

Richard A. Becker, Fayetteville, Ark.; Paul R. Hill, Castro Valley, Calif., and Robert R. Hobson, San Jose, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 21, 1968, Ser. No. 784,988
Int. Cl. H02n 3/00
U.S. Cl. 310—4 7 Claims



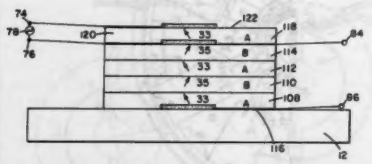
An improved thermionic converter cell is provided for use with a cylindrical fuel ring space power reactor. The collector of a conventional converter cell is modified to enclose a vapor chamber condenser which carries the generated heat through a beryllium oxide reflector to an external heat sink. The combination of beryllium oxide as the reflector material and vapor chamber condensers provides a radial neutron reflector which has both good nuclear properties and high effective thermal conductivity.

3,590,287

PIEZOELECTRIC THIN MULTILAYER COMPOSITE RESONATORS

Don A. Berlincourt, Chagrin Falls, and Todd R. Sliker, Shaker Heights, both of, Ohio, assignors to Clevite Corporation

Continuation-in-part of application Ser. No. 595,073, Nov. 17, 1966, now abandoned. This application Sept. 5, 1968, Ser. No. 768,584
Int. Cl. H01v 7/00
U.S. Cl. 310—8.2 9 Claims



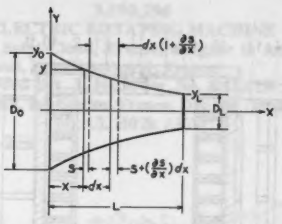
Alternate thin layers of piezoelectric material having differently orientated piezoelectric axes with respect to each other are placed on a substrater and electroded to form a high frequency resonator. The thickness mode resonant frequency of the composite structure corresponds a proper fraction of the resonator operating frequency, layer thickness varying between 0.2 and 100 microns corresponding to approximately 10 percent of the substrate thickness.

3,590,288

PIEZOELECTRIC TRANSDUCER UTILIZING A CATENOIDALLY TAPERED HORN

Hildegard M. Minchenko, Reynoldsburg, Ohio, assignor to The Ohio State University, Columbus, Ohio

Filed June 13, 1969, Ser. No. 833,099
Int. Cl. H04r 17/00
U.S. Cl. 310—8.2 5 Claims



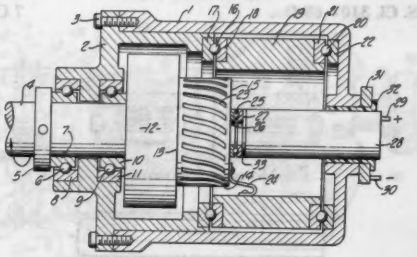
A piezoelectric transducer for converting high power electrical energy to high power mechanical energy at a sonic frequency range. Specifically, the invention is an electromechanical transducer capable of delivering high power levels (30 kw) in a high-Q, high efficiency construction utilizing ceramic polycrystalline driving elements. Reference is made to the claims for a legal definition of the invention.

3,590,289

ANGULAR ACCELERATION SENSOR WITH PIEZOELECTRIC ELEMENT

Fritz Ostwald, Buchschlag, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 9, 1969, Ser. No. 831,421
Claims priority, application Germany, June 11, 1968, 1773606
Int. Cl. H01v 7/00
U.S. Cl. 310—8.4 4 Claims



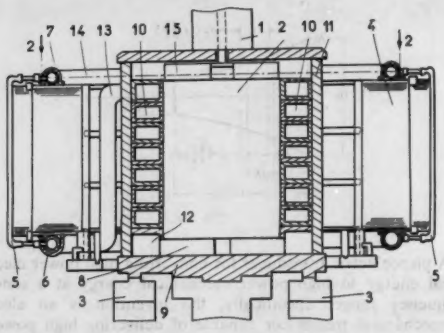
A rotary accelerometer using a piezoxide (prepolarized ceramic piezoelectric element). A shaft drives a rotating mass in the form of a cylindrical sleeve through a resilient connection in one embodiment. During angular deceleration, the rotating mass tends to lead because of inertia and the resulting force is applied to a cam device which converts that force into a compressive stress applied to the piezoxide to generate a voltage analog of deceleration. In another embodiment a block mass is attached to a piezoxide block directly, so that inertial forces during deceleration are directly applied to the piezoxide. The combination is then mounted so as to respond to tangential forces about a decelerating shaft.

3,590,290

COOLING SYSTEMS FOR AMORTISSEUR WINDINGS OF DYNAMO ELECTRIC MACHINES

Gilbert Ruelle; Roger Gillet; Michel Tritsch; Christian Lehuen, and Morduch Portnoi, all of Belfort, France, assignors to Societe Generale De Constructions Electriques Et Mecaniques Alsthom, Paris, France

Filed Dec. 8, 1969, Ser. No. 883,000
Claims priority, application France, Dec. 23, 1968, 180,170
Int. Cl. H02k 9/19
U.S. Cl. 310—54 10 Claims



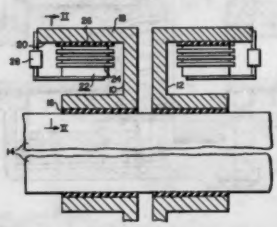
A fluid reservoir, centrally of a rotating shaft is interconnected with ducts formed in the interior of the amortisseur windings to cool the same by traversing the windings with fluid from the reservoir. The interconnection includes a plurality of turns, coaxial with the machine, for example located at the inside of the fluid reservoir and against the wall thereof, so that upon starting fluid will immediately be forced into the amortisseur windings without outside auxiliary pumps.

3,590,291

BRUSHLESS EXCITER COMPONENT ASSEMBLY

Andrew J. Spisak, Pittsburgh, and Thayer L. Dillman, North Versailles, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1969, Ser. No. 875,351
Int. Cl. H02k 11/00
U.S. Cl. 310—68 D 7 Claims



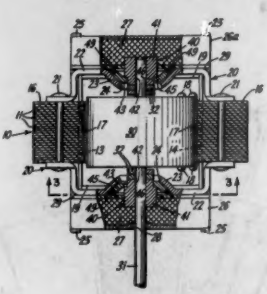
A rotating rectifier-voltage suppressor combination for brushless generator excitation with minimized weight and axial length is provided having a heat sink mounted on the inner surface of a rectifier wheel rim; at least one diode and a voltage suppressor package are mounted on the same heat sink. The voltage suppressor package includes at least a capacitor with possible additional components including a voltage divider resistor in parallel with the capacitor and diodes and/or a resistor in series with the capacitor. Simplified mounting means are provided to permit easy removal of the heat sink, diodes and voltage suppressor package (as well as a fuse protecting against failure of a diode or capacitor) for inspection and repair.

3,590,292

ELECTRIC MOTOR CONSTRUCTION

Theodore E. Poliakoff, Alexandria, Va., assignor to American Machine & Foundry Company

Filed Nov. 28, 1969, Ser. No. 880,816
Int. Cl. H02k 5/16
U.S. Cl. 310—90 7 Claims



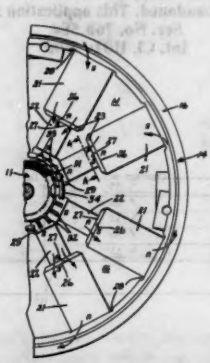
In an electric motor with a rotor and shaft fixed for rotation in unison and a U-shaped bracket connected to each side of the stator, the bight portion of each bracket having a deformation and opening therethrough substantially aligned axially with the deformation and opening of the other bracket and the rotor bore of the stator. Bearing arrangement for the shaft on both sides of the rotor each having an end portion of similar shape and engaging one of the deformations and being connected thereto by an epoxy so the bearing arrangement retains the rotor in alignment with the rotor bore.

3,590,293

DYNAMOELECTRIC MACHINE HAVING A STATIONARY ASSEMBLY OF THE PERMANENT MAGNET TYPE

Robert A. Susdorf, Fort Wayne, Ind., assignor to General Electric Company

Continuation-in-part of application Ser. No. 636,507, May 5, 1967, now abandoned. This application Sept. 29, 1969, Ser. No. 867,115
Int. Cl. H02k 21/26
U.S. Cl. 310—154 5 Claims



A dynamoelectric machine incorporating permanent magnet stationary structure capable of use requiring fast electrical response and acceleration rates, such as peripheral computer and machine tool applications. The magnetic poles of the stationary structure include at least two permanent magnets in series circuit relation of different magnetic charac-

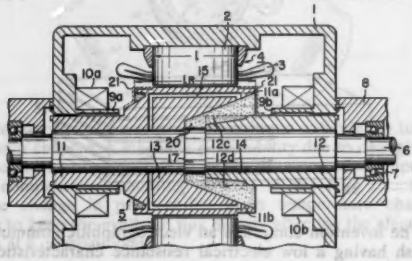
teristics and size having a flux shunt therebetween to develop high flux densities in the airgap, to permit good dissipation of heat from the poles, and to attain generally balanced high energy operation. The stationary structure also includes a single short-circuited winding adjacent the bore tending to linearize acceleration of the machine.

3,590,294

SYNCHRONOUS MACHINE PROVIDED WITH COMB-SHAPED MAGNETIC POLES

Junpei Inagaki; Hiroyuki Kitamura, and Hideo Sumitani, all of Yokohama-shi, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha Ca.K.a. Tokyo Shibaura Electric Co., Ltd., Kanagawa-ken, Japan

Filed Sept. 2, 1969, Ser. No. 854,473
Claims priority, application Japan, Sept. 3, 1968, Sept. 16, 1968, Nov. 28, 1968, 43/75885;43/79448;43/86680
Int. Cl. H02k *19/00*
U.S. Cl. 310—162 4 Claims



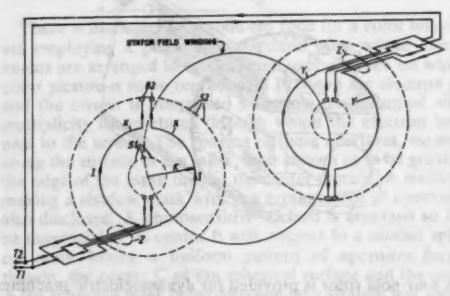
Disclosed herein is a synchronous machine having a pair of opposite magnetic rotor members with interleaved poles of opposite polarities, wherein portions of the rotor members between adjacent poles are cut away, and the inner corners of each pole are also cut away to decrease leakage flux; and the diameter of portions of the poles outside the armature core are reduced to decrease armature leakage reactance.

3,590,295

HOMOPOLAR ELECTRICAL MACHINES

Anthony Derek Appleton; Robert B. MacNab, and Joseph Merelie Elliott, all of Newcastle-upon-Tyne, England, assignors to International Research & Development Company Limited, Newcastle-upon-Tyne, England

Filed Nov. 3, 1969, Ser. No. 873,398
Claims priority, application Great Britain, Nov. 8, 1968, 53136/68
Int. Cl. H02k *31/00*
U.S. Cl. 310—178 5 Claims



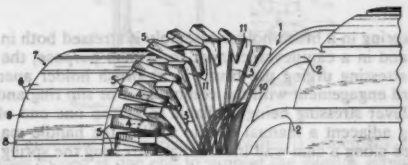
A homopolar electrical machine having a plurality of rotor conductors and having brushes cooperating with the rotor conductors and interconnected by stationary conductors to form two parallel circuits between the terminals of the machine. The two circuits including series-connected rotor conductors from sections of the rotor lying on opposite sides of a diameter of the rotor and the circuits being maintained continuously as the rotor conductors engage and disengage successive brushes, wherein for the purpose of reducing forces on the stator windings stationary compensating conductors are connected between the machine terminals and the brushes. In the case of a disc rotor with radial rotor conductors the compensating conductors can be two in number and follow arcuate paths of equal radius coaxial with and in a plane parallel to the rotor.

3,590,296

ELECTRIC ROTATING MACHINE

Rene Dumez, Saint-Cloud, France, assignor to Aciers Et Outillage Peugeot, Levallois-Perret, France

Filed Oct. 3, 1969, Ser. No. 863,429
Claims priority, application France, Dec. 20, 1968, 179,481
Int. Cl. H02k *13/04*
U.S. Cl. 310—234 2 Claims



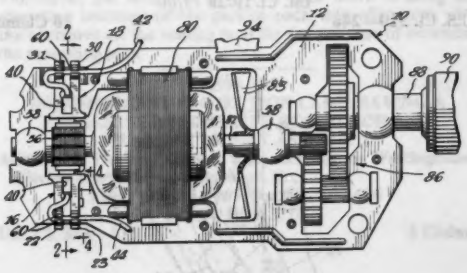
A rotating electric machine of the type in which the connection ends of the bars of the commutator are connected by connecting wires to the armature windings. Elements of insulating material are interposed between the connection ends of the commutator bars to preclude contact between the connecting wires.

3,590,297

MOTOR BRUSH WIRE MOUNTING MEMBERS

Earl F. Smith, Lombard, and Anthony Jacyno, Aurora, both of, Ill., assignors to G. W. Murphy Industries, Inc.

Filed Oct. 16, 1969, Ser. No. 866,851
Int. Cl. H02k *13/00*
U.S. Cl. 310—239 14 Claims

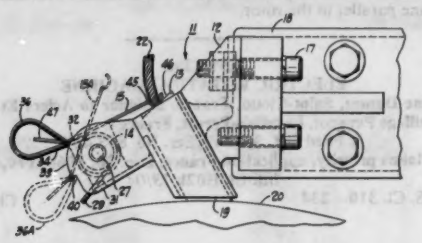


Clips are provided for holding brush lead wires and for anchoring the brush mounting members during assembly of an electric motor driven portable device to prevent pinching of the lead wires between the casing members. Each clip member includes a snap-receiving cavity for receiving and holding the wire near the end connected to the brush. The wire extending from the snap-receiving cavity through a slot in the clip member to contact the brush is parallel to the sliding axis of the brush. A spring urges the end of the wire against the rear of the brush and urges the brush against the armature commutator of the motor and the slot permits the wire to follow the sliding movement of the brush. The terminal end of the wire is received around a projection on the rear of the brush which also receives the spring.

3,590,298
BRUSH HOLDER ASSEMBLY

Bernard T. Hudak, Athens, Ga., assignor to Reliance Electric Company

Filed Mar. 20, 1970, Ser. No. 21,349
Int. Cl. H01r 39/40
U.S. Cl. 310—246 14 Claims

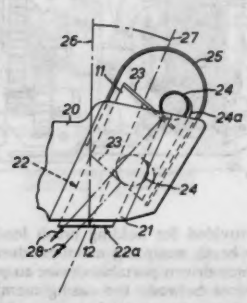


A spring in a brush holder assembly is stressed both in torsion and in a cantilever manner for a dual purpose, the torsion stressing urging the brush in its brush holder aperture toward engagement with the commutator or slip ring and the cantilever stressing being available to act on one end of the spring adjacent a manual handle so that the handle may be moved along a cam wall increasingly stressing the spring in a cantilever direction until a detent notch is received whereat the spring is resiliently held in place and the torsion urging on the brush has been released. This permits an operator with one hand to release this spring urging on the brush and remove the brush from the dynamoelectric machine. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,590,299
BRUSH ARRANGEMENT FOR DYNAMO ELECTRIC MACHINES

Peter Kenneth Clifford Wiggs, Tadworth, and Kelvin Golden Hughes, Kenton, Harrow, both of, England, assignors to Morganite Carbon Limited, London, England

Filed May 7, 1969, Ser. No. 822,352
Claims priority, application Great Britain, May 15, 1968, 23148/68
Int. Cl. H02k 13/00
U.S. Cl. 310—246 8 Claims

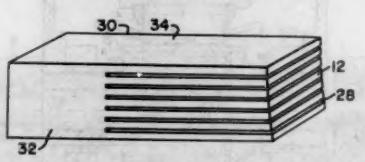


The invention relates to a brush arrangement for a dynamoelectric machine. The brush arrangement includes a brush box having a brush locating surface, a split brush having a first brush portion adjacent the locating surface and a second brush portion remote from the locating surface. The split brush has a bevelled outer end. According to the invention, a pressure plate is secured on the bevelled outer end of the remote brush portion. The plate has a first extension overlying the bevelled outer end of the adjacent brush portion and a second extension which projects as a cantilever from the restore brush portion in a direction away from the adjacent brush portion. The arrangement includes a pressing device engaging the second extension of the plate. In this arrangement, the adjacent and remote portions of the split brush are maintained together and the adjacent portion is maintained against the locating surface of the brush box. In addition, the inner ends of the brush portions are kept together irrespective of the direction of rotation of the collector ring.

3,590,300
COMMUTATING BRUSH HAVING IMPROVED RESISTANCE AND RIDING CHARACTERISTICS

Lawrence E. Moberly, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of application Ser. No. 682,391, Nov. 13, 1967, now abandoned. This application Sept. 22, 1969, Ser. No. 860,118
Int. Cl. H02k 13/00
U.S. Cl. 310—248 4 Claims

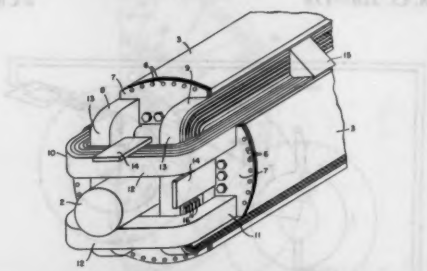


The invention comprises an electrographitic commutating brush having a low electrical resistance characteristic in a direction substantially perpendicular to a working face of the brush, and a high electrical resistance characteristic in the direction of brush movement relative to a commutator. To produce such characteristic resistances, the body of the brush is provided with voids or cavities controlled in size and shape, and oriented to have elongated dimensions in planes perpendicular to the working face of the brush, and in planes perpendicular to the direction of relative brush rotation with the commutator.

3,590,301
ROTOR FOR DYNAMOELECTRIC MACHINE

Gunter Woydt, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 24, 1970, Ser. No. 31,615
Claims priority, application Germany, Apr. 25, 1969, P 19 22 153.5
Int. Cl. H02k 1/24
U.S. Cl. 310—269 4 Claims



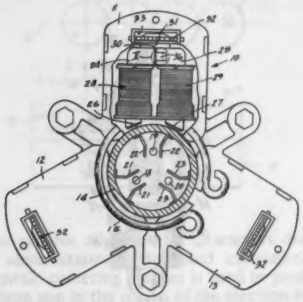
A four-pole rotor is provided for dynamoelectric machines in which the exciting winding consists of a plurality of coils, preferably wound of strap conductors, which are constructed so that they can be inserted radially over the pole members and held in place with each coil engaging the same sides of two diametrically opposite poles. In this way the windings can be applied after complete assembly of the rotor, per-

mitting more secure attachment of the poles to the rotor body.

3,590,302
TEMPERATURE COMPENSATED CONVERGENCE COIL FOR CATHODE RAY TUBES

Robert W. Bussey, Marshall, Ill., assignor to TRW Inc., Cleveland, Ohio

Filed Sept. 2, 1969, Ser. No. 854,412
Int. Cl. H01f 1/10, 7/06; H01j 29/80
U.S. Cl. 313—77 **8 Claims**

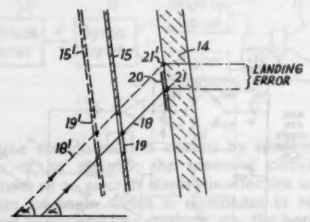


Convergence coil assembly for multigun cathode ray tubes in which changes in magnetic permeability due to changes in temperature are compensated by the provision of a temperature compensating shunting element in the core structure whose change in permeability upon temperature change tends to keep the available flux density affecting the electron beam at a constant value.

3,590,303
COLOR TUBE HAVING SHADOW MASK WHOSE CENTER-TO-CENTER APERTURE SPACINGS INCREASE RADIALLY OUTWARD FROM MASK CENTER

Robin C. Colclough, London, England, assignor to Thorn Radio Valves and Tubes Limited, London, England

Filed May 31, 1968, Ser. No. 733,439
Claims priority, application Great Britain, June 6, 1967, 26126/67
Int. Cl. H01j 29/32, 29/06
U.S. Cl. 313—92 **2 Claims**

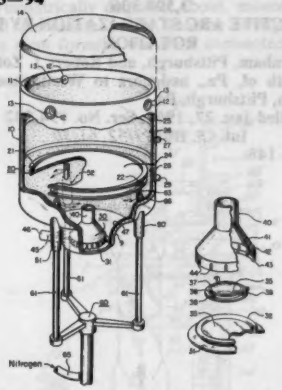


There is disclosed a cathode-ray tube for a color television set employing a plurality of electron guns whose electron beams are arranged to be deflected over a screen on which a color picture is to be reproduced. Between the electron guns and the screen is interposed a shadow mask formed with a multiplicity of apertures through which the electron beams pass to the screen. The spacing of these apertures, measured along the surface of the mask, is so chosen as to be greater at the edge of the mask than at the center thereof. A method of making a shadow mask with this arrangement of apertures is also disclosed. A photosensitive surface is arranged so as to be tangential at its center E with respect to a smaller spherical mask having a uniform pattern of apertures formed therein, the center C of the spherical surface and the center A the spherical mask being disposed on a straight line passing through the point E. The photo sensitive surface is illuminated through the apertures in said mask from a point light source located at a point O on said line so selected that OD/OB is greater than unity, where D is any point on said photo sensitive surface impinged upon by light from O passing through an aperture at the point B.

3,590,304
IMAGE INTENSIFIER

Josef Moegenbier, Morton Grove, Ill., assignor to Zenith Radio Corporation

Division of Ser. No. 669,470, Sept. 21, 1967, now patent No. 3,515,924.
Filed Nov. 13, 1969, Ser. No. 876,423
Int. Cl. H01j 19/50, 31/50, 39/04
U.S. Cl. 313—94 **3 Claims**



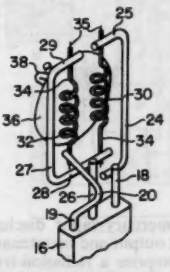
The envelope of the image intensifier is principally a glass cylinder closed at one end to support the viewing screen and having a sealing land at the other end with a series of apertures spaced thereabout. This end of the envelope is closed by a glass cap secured to the sealing land by a glass to glass seal. The photocathode has a supporting frame dimensioned to be positioned within the principal envelope section and having threaded mounting bushings in radial alignment with the apertures in the sealing land of the envelope, respectively. Mounting pins inserted through the openings of the envelope thread into these bushings and mechanically secure the photocathode in position. Each pin is sealed to the envelope in a vacuum-tight seal.

In manufacturing the image intensifier three tubulations are affixed to the envelope, being spaced about the viewing screen thereof, and a fixture having three tines is inserted through these tubulations into the envelope and advanced toward the sealing land. The pickup pack is rested on the ends of these tines and the fixture is then withdrawn to draw the pickup pack away from the sealing land where it remains until the cap is sealed to the principal envelope section. Thereafter, the fixture is advanced once more to bring the mounting bushings of the pickup pack into alignment with the apertures on the sealing land for the purpose of receiving the mounting pins.

3,590,305
INCANDESCENT PROJECTION LAMP HAVING A PREALIGNED PROXIMITY REFLECTOR AND FILAMENT MOUNT ASSEMBLY

Aristide R. Decaro, Edison, N.J., assignor to Westinghous Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1969, Ser. No. 802,426
Int. Cl. H01j 5/16
U.S. Cl. 313—115 **5 Claims**



A pair of separately wound coiled-coil filaments are connected in series and suspended in coplanar relationshio in

front of a concave metal reflector by a mount assembly that is formed from the inner ends of the lead wires and an auxiliary conductor that is fastened to a spud wire. Suspension of the two filaments is achieved without the glass bridge members customarily employed and the proper reflector-filament spacing is obtained by attaching the reflector to the mount assembly by a single prebent support wire.

3,590,306
CONVECTIVE ARC STABILIZATION BY LAMP ROTATION

Walter J. Burnham, Pittsburgh, and Robert J. Zollweg, Monroeville, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

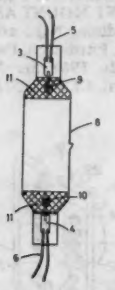
Filed Jan. 27, 1969, Ser. No. 794,202
Int. Cl. H01j *1/52, 61/30*
U.S. Cl. 313—148 **1 Claim**

A constricted arc-discharge device having means for physically rotating the arc-tube about the longitudinal axis of the arc-tube to stabilize and maintain the constricted arc proximate the longitudinal axis of the arc tube. This device thereby avoids problems caused by arc bowing of the constricted arc-discharge. The device operates with a discharge sustaining filling comprising mercury and metallic halide and provides an extremely efficient source of visible radiation.

3,590,307
ADDITIVE-TYPE HIGH-PRESSURE MERCURY-VAPOR DISCHARGE DEVICE HAVING GOOD ULTRAVIOLET OUTPUT

Alexander Dobrusskin, Taufkirchen, and Achim Lange, Munich, both of, Germany, assignors to Patent-Treuhand-Gesellschaft Fur Elektrische Gluhlampen m.b.H., Munich, Germany

Filed Dec. 31, 1969, Ser. No. 889,600
Claims priority, application Germany, Jan. 8, 1969, P 19 00 765.9
Int. Cl. H01j *61/18*
U.S. Cl. 313—184 **4 Claims**

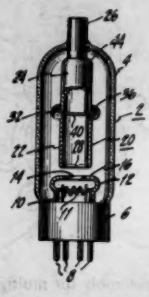


A high-pressure mercury-vapor discharge device having improved ultraviolet output and maintenance of initial output during operation comprise a radiation-transmitting arc tube having a fill consisting of inert ionizable starting gas, a predetermined charge of mercury, iron, halogen (preferably iodine) as required to react with the iron to form ferrous halide, and stannic halide (preferably the iodide).

3,590,308
HIGH VOLTAGE ELECTRON DISCHARGE TUBE HAVING AN ANODE TARGET

Janet L. Deckert, Red Bank, N.J., assignor to RCA Corporation

Filed Apr. 1, 1969, Ser. No. 811,724
Int. Cl. H01j *1/05, 1/14*
U.S. Cl. 313—311 **4 Claims**

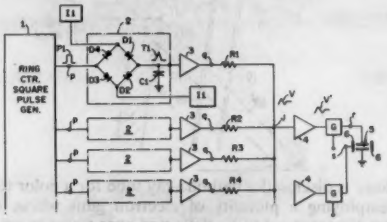


In high voltage electron tubes, such as type RCA 6BK4, comprising a cathode, and an open-ended tubular anode including an electron receiving target within the anode tubulation, the target is made from a refractory metal such as molybdenum or tantalum, coated with chromium.

3,590,309
CHARACTER DISPLAY SYSTEM

Nephi Edward Berg, Bedford, N.H., assignor to Hendrick Electronics Inc., Milford, N.H.

Continuation-in-part of application Ser. No. 587,583, Oct. 18, 1966, now Patent No. 3,500,212. This application June 23, 1969, Ser. No. 835,591
Int. Cl. H01j *29/70*
U.S. Cl. 315—18 **5 Claims**

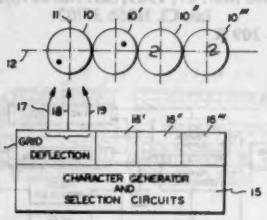


A generator of deflection waveforms for tracing the sloped traverses of alphanumeric characters on a cathode-ray tube comprises a ring counter generating a plurality of equal square waveforms successively occurring at constant frequency. In each of a plurality of channels from the generator each square wave is converted by a diode bridge into a triangular pulse overlapping the successive triangular pulse in another channel. All the triangular pulses overlap a preceding or succeeding pulse by an equal interval of time. Further in each channel an attenuator network modified the amplitude of each triangular pulse. The modified triangular pulses are all combined at a summing junction to form the several traverses of a composite waveform which produces the horizontal or vertical deflection voltage which causes the cathode-ray to trace a character on the screen of the tube.

3,590,310
CHARACTER ALIGNMENT IN CATHODE-RAY DISPLAY TUBES

Horst H. Blumenberg, Owensboro, Ky., assignor to Kentucky Electronics Corporation, Owensboro, Ky.

Filed July 22, 1969, Ser. No. 844,315
Int. Cl. H01j 29/82
U.S. Cl. 315—18 4 Claims



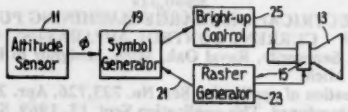
In order to achieve alignment of characters displayed on side-by-side electrostatically deflected cathode-ray indicia tubes, a magnetic centering magnet is used to project a field into the electron gun in the region of the electron beam path.

To avoid influencing adjacent tubes the magnet is flat and is placed and held adjacent the outside of the tube envelope in a position to standardize the character position by means of a thin strip or web of low permeability magnetic material having an adhesive backing, thereby limiting the projection of the external magnetic field from affecting other closely positioned tubes.

3,590,311
AIRCRAFT CRT DISPLAY APPARATUS

Colwyn Francis Stone, Chatham, England, assignor to Elliott Brothers (London) Limited, London, England

Filed Aug. 20, 1969, Ser. No. 851,578
Claims priority, application Great Britain, Aug. 21, 1968, 39,906/68
Int. Cl. H01j 29/72
U.S. Cl. 315—22 3 Claims



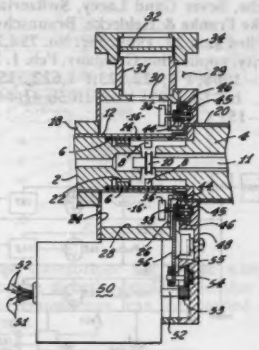
To overcome the distraction caused by small roll angle perturbations of an aircraft, the scanning circuitry of a cathode-ray tube of an aircraft display is effective to scan the tube target an an angle which is significant in relation to earth stabilized horizontal line symbols, e.g. the horizon symbol. Preferably the scanning direction is perpendicular to such horizontal line symbols when the aircraft is "wings level." As a result, the "resulting travelling staircase effect," encountered in the display of horizontal lines in displays in which the scanning direction is parallel to such lines in level flight, is avoided.

3,590,312
TUNABLE COAXIAL MAGNETRON

David Edward Blank, Mountain View; Geoffrey Thornber, Sunnyvale, and Anthony Peter Wynn, Redwood City, all of, Calif., assignors to Litton Precision Products Inc., San Carlos, Calif.

Filed Apr. 16, 1969, Ser. No. 816,751
Int. Cl. H01j 25/50
U.S. Cl. 315—34.61 25 Claims

A coaxial magnetron is provided in which the annular outer coaxial cavity is external of the high vacuum region containing the anode, vanes, cathode, and interaction region. The coaxial cavity is electromagnetically coupled to alternate pairs of the vanes conventionally through slits in the sleevelike anode wall, but is physically separated or isolated therefrom by a ceramic sleeve, suitably alumina, which seals the vacuum within the anode wall but which is permeable to electromagnetic energy. Moreover, the coaxial cavity is maintained under pressure at least as great as atmospheric pressure and, suitably, 35 p.s.i. a. (absolute) with an insulating gas, suitably sulfur hexafluoride. A plurality of dielectric vanes are symmetrically disposed about, mounted rotatably through, and proximate to an annular cavity wall. These vanes have a stem forming the shaft connected centrally of

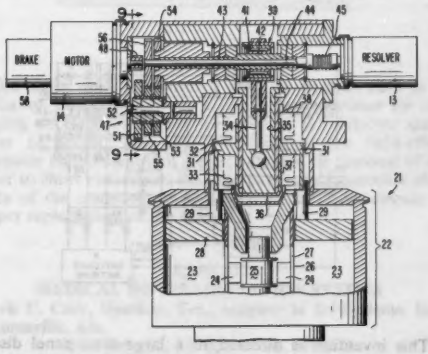


the vanes, together resembling the letter T, mounted with the longer axis of the vane perpendicular to the axis of the cavity. These vanes are connected through the supporting wall by the stemlike portion which has its axis parallel generally to the axis of the cavity. Suitably the dielectric vanes consist of alumina, a high purity aluminum oxide ceramic. The vanes are positionally phased and means are connected to each of the plurality of vanes in synchronism whereby the magnetron is dithered at relatively high rates. This latter means and housing internally are included within the same insulating gas atmosphere as the cavity so that no moving parts extend through a pressure differential.

3,590,313
DITHER TUNED MICROWAVE TUBE WITH CORRECTED TUNER RESOLVER OUTPUT

Richard C. Stoke, Chatham, N.J., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 22, 1970, Ser. No. 5,025
Int. Cl. H01j 25/50
U.S. Cl. 315—39.61 6 Claims



A dither tuned microwave tube having a corrected tuner resolver output signal is disclosed. A pair of eccentric gear

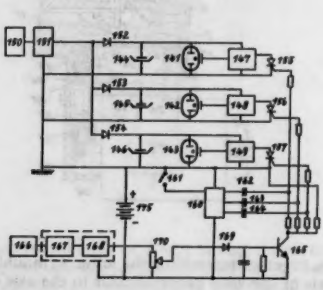
compensators are employed in the gear train to drive the dither tuner and resolver from a motor. The pair of eccentric compensating gears may be employed in the gear train to change the resolver output to conform to the nonlinear tuning curve or, alternatively, the pair of eccentric compensating gears may be employed to change the tuning curve to match the linear resolver output.

3,590,314

ELECTRONIC FLASHLAMP APPARATUS HAVING A PLURALITY OF FLASH TUBES SUCCESSIVELY IGNITED

Achim Krusche, Sever Gand Lacey, Switzerland, assignors to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Jan. 27, 1969, Ser. No. 794,298
Claims priority, application Germany, Feb. 1, 1968, Feb. 7, 1968, P 1,622,323;P 1,622,325
Int. Cl. G01j 1/18; H05b 41/44
U.S. Cl. 315—151 **14 Claims**



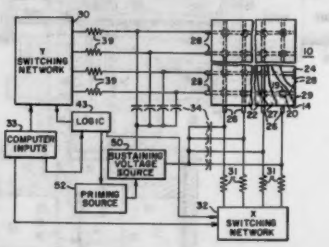
Electronic flashlamp apparatus, for photographic or other purposes, using a plurality of flash tubes fired in quick succession. A photo responsive circuit stops the firing sequence when the light produced by the tubes already fired has reached a cumulative total sufficient for the intended purpose, thus dispensing with further tube firing and saving the stored energy which would be used if further firing took place, the saved energy being available for use in subsequent firing operations. Several alternative circuit arrangements are described.

3,590,315

PLASMA PANEL DISPLAY SWITCH HAVING A SOURCE OF PRIMING VOLTAGE

Wallace J. Hoff, and Robert M. Willson, Ellicott City, both of, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1969, Ser. No. 819,909
Int. Cl. H05b 41/20, 41/44
U.S. Cl. 315—169R **6 Claims**



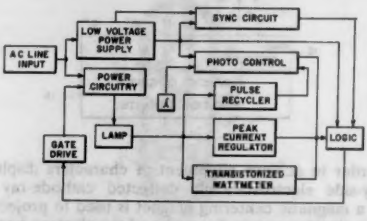
This invention is directed to a large area panel display system comprised of a plurality of gas discharge elements or cells which may be individually controlled for the display of a visual image. More particularly, this invention is directed to systems and appropriate excitation waveforms to ensure that the gas cells are in condition and will fire on application of appropriate voltages to the cells.

3,590,316

PHASE-CONTROLLED UNIVERSAL BALLAST FOR DISCHARGE DEVICES

Joseph C. Engel; Robert T. Elms, both of Pittsburgh, Pa., and assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1969, Ser. No. 807,659
Int. Cl. H05b 37/02
U.S. Cl. 315—209 R **10 Claims**



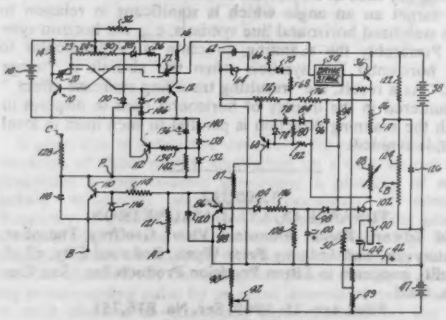
Apparatus for ballasting any of a plurality of discharge devices having varying voltage and current operating characteristics in order to operate a discharge device at about a predetermined wattage rating. A ballasting impedance limits the maximum current through the operating device and a semiconductor switch is closed in response to a triggering signal to vary the average wattage consumed by an operating device. The circuit includes a solid-state wattmeter having an input portion which develops a signal which is proportional to the current drawn by an operating device, as well as a signal which is proportional to the voltage drop across an operating device. These signals are combined to generate a signal which represents the logarithm of their product. The logarithmic signal is then converted into an antilogarithmic signal which in turn is averaged. The resulting averaged signal controls the triggering of the semiconductor switch to maintain the wattage input to an operating device at about its predetermined desired value.

3,590,317

ELECTRICAL DISCHARGE MACHINING PULSE CURRENT CONTROL APPARATUS

Kurt H. Sennowitz, Royal Oak, Mich., assignor to Elox Inc., Troy, Mich.

Continuation of application Ser. No. 723,726, Apr. 24, 1968, now abandoned. This application Sept. 15, 1969, Ser. No. 857,966
Int. Cl. H01j 11/04, 13/48, 17/36
U.S. Cl. 315—332 **3 Claims**



A circuit for providing electrical discharge machining power pulse on-off time control responsive to gap open circuit condition with controlled timing of pulse narrowing and return to normal pulse duration.

3,590,318

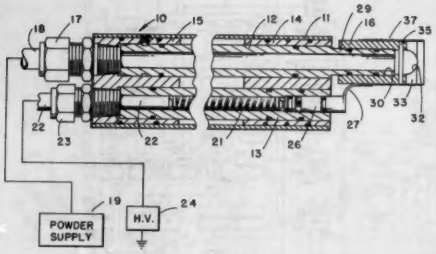
POWDER COATING APPARATUS PRODUCING A FLAT POWDER SPRAY

Richard O. Probst, and David D. Harrold, both of Indianapolis, Ind., assignors to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Continuation of application Ser. No. 579,233, Sept. 14, 1966, now abandoned. This application Dec. 8, 1969, Ser. No. 878,984

Int. Cl. B05b *1/04, 5/00*

U.S. Cl. 317—3 22 Claims



A nozzle for a powder spray gun having an elongated orifice from which a gas suspension of the powder is discharged in a flat, fanlike spray. The nozzle includes means adjacent the orifice inside the nozzle to force convergence of the suspension at the orifice and means in the flow of the suspension rearwardly from orifice cooperating with the means forcing convergence of the suspension to promote uniformity of powder distribution in the spray. The powder spray gun may include a suitable electrode adapted for connection to a high-voltage source to charge and promote the deposition of the powder particles in the spray.

3,590,319

APPARATUS FOR ATTENUATING VOLTAGE SURGES

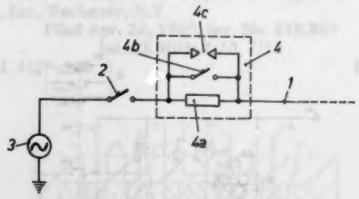
Paul Baltensperger, Wurenlos, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed July 18, 1969, Ser. No. 843,059

Claims priority, application Switzerland, July 24, 1968, 11111/68

Int. Cl. H02h *7/22*

U.S. Cl. 317—11 C 4 Claims



In order to attenuate voltage surges which may occur on a high-voltage line upon closing or opening of a power switch located at an end of the line which serves to connect the line to a supply source, an attenuating resistance assembly which is structurally separate from the power switch itself is connected into the line on the line side of the power switch. This attenuating assembly includes a resistance component in series with the line and having connected in parallel with it a bypass switch and an overvoltage protective device which may be in the form of a spark gap. The bypass switch is opened prior to opening of the power switch, and the overvoltage protective device establishes a limit to the voltage which can be impressed across the attenuating resistance component. A compensating choke coil can also be connected to the line at either side of the attenuating resistance component. In a circuit closing operation, the power switch closes first followed by closing of the bypass switch after a brief time delay.

3,590,320

VOLTAGE TRANSFORMER WITH REMOVABLE HIGH VOLTAGE FUSES

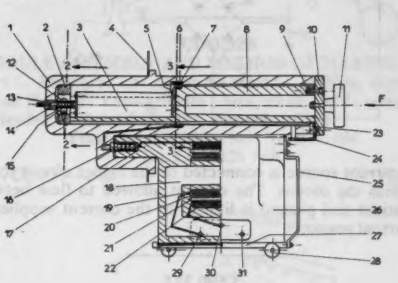
Robert Conroi, 32, rue Ste Catherine, 51 Ste Menehould, Marne, France

Filed Oct. 14, 1968, Ser. No. 767,383

Claims priority, application France, Oct. 19, 1967, 125688

Int. Cl. H02h *7/04*

U.S. Cl. 317—15 4 Claims



A high voltage transformer has a fuse with high cutoff power which can be directly extracted so that all measurements from the transformer can be carried out without shutting off voltage.

3,590,321

FIRE ALARM DEVICE

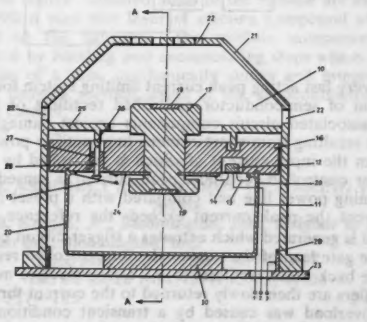
Andreas Scheidweiler, and Max Kuhn, both of Stafa, Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed July 31, 1968, Ser. No. 749,166

Claims priority, application Switzerland, Aug. 9, 1967, 11,200/67

Int. Cl. H02h *5/12*

U.S. Cl. 317—16 9 Claims



Fire alarm devices wherein a detector element such as an ionization chamber includes a field-effect transistor for amplifying an electrical signal produced by the detector and a cover to protect the gate electrode of the field-effect transistor including switch means operable on removal of the cover to short circuit and the gate electrode to another electrode of the transistor and to remove the short circuit on proper replacement of the cover.

3,590,322

MEDICAL INSTRUMENTATION SYSTEM

Travis C. Carr, Houston, Tex., assignor to Sci Systems, Inc., Huntsville, Ala.

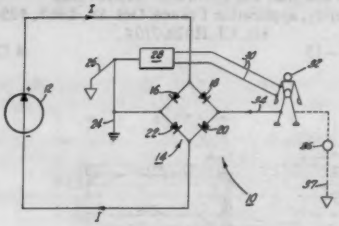
Filed Feb. 12, 1970, Ser. No. 010,736

Int. Cl. H02h *3/08*

U.S. Cl. 317—18 D 11 Claims

A device for protecting patients against excessive currents which might flow through the patients from medical electri-

cal equipment. A full-wave diode bridge rectifier circuit is connected between the patient and ground and provides a low-impedance path between the patient and ground. A constant current source is connected to the bridge circuit to forward-bias the diodes. The current allowed to flow between the patient and ground is limited to the current supplied by the current source.

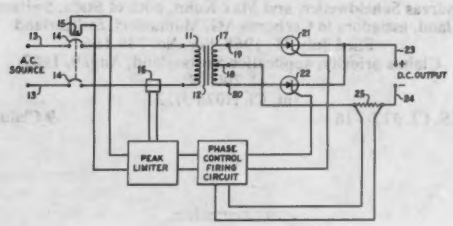


3,590,323

PEAK CURRENT LIMITING SYSTEM

Neville Mapham, Rochester, and James H. Galloway, New Baltimore, both of, Mich., assignors to Udylite Corporation, Warren, Mich.

Filed Jan. 22, 1970, Ser. No. 005,069
Int. Cl. H02h *7/14*
U.S. Cl. 317—22 **20 Claims**



A very fast acting peak current limiting system for the protection of semiconductor controlled rectifiers or thyristors and associated circuit components against damaging overloads resulting from short circuits. In a rectifier power supply system the input current of which is controlled by semiconductor controlled rectifiers, peak current is sensed on each incoming power line and compared with a preset reference. In event the peak current exceeds the reference, an error signal is generated which actuates a trigger circuit connected to the gate lead of the semiconductor controlled rectifiers to phase back these rectifiers to the nonconductive mode. The rectifiers are then slowly returned to the current threshold. If the overload was caused by a transient condition, normal current will flow. If the overload was due to a persistent condition, the slow return of the semiconductor rectifiers to an overload condition will permit supplementary control systems having a slower time response to control the current into the rectifiers. Such supplementary control system may comprise subsystems to control overloads due to either internal faults within the power supply system or external faults.

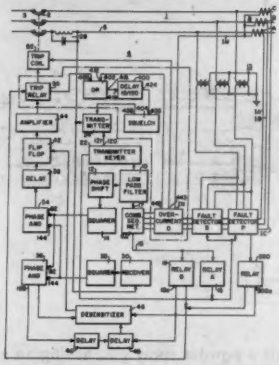
3,590,324

PHASE COMPARISON RELAYING NETWORK

George D. Rockefeller, Jr., Morris Plains, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 27, 1969, Ser. No. 837,242
Int. Cl. H02h *3/28, 7/26*
U.S. Cl. 317—28 **17 Claims**

A protective relaying apparatus especially useful in protecting a line section of a transmission line in which the line section has at least first and second terminals connected through first and second breaker switches to busses at first and second switching stations and in which operating information of the line section is transmitted between the first and second stations. The relaying apparatus at, at least the first station, embodies a pair of fault sensors in which a first thereof is actuated due to the occurrence of faults in at least that portion of the protected transmission line section and beyond and which sensor is effective to actuate the breaker switch associated therewith solely when the information supplied to the apparatus indicates the fault to be within the protected line section. The second fault sensor is actuated in response to the occurrence of faults which occur solely in a predetermined fractional portion of the protected line section and independently of the information supplied to the apparatus from any other station to actuate the adjacent breaker switch and to transmit information advising the second station of the actuation of the second fault sensor at the first station.

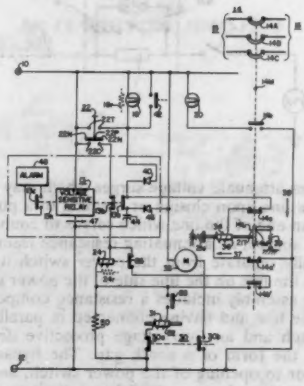


3,590,325

UNDERVOLTAGE DETECTION AND ENERGY STORAGE TRIP CURRENT

James W. McMillen, Monroeville, and Michael J. Onofrey, West Mifflin, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 16, 1970, Ser. No. 019,630
Int. Cl. H02h *3/24*
U.S. Cl. 317—31 **6 Claims**

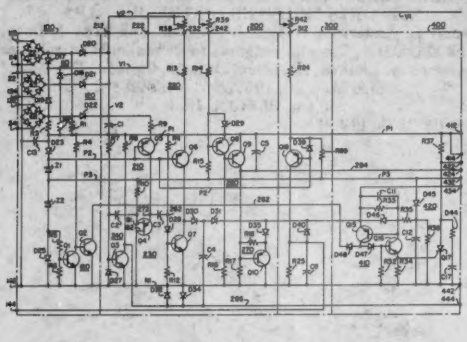


A circuit for sensing an undervoltage condition of a circuit breaker control power supply voltage. This circuit upon sensing the low voltage prevents the circuit breaker from being closed if it is open and opens the circuit breaker if it is closed and at the same time may actuate an alarm.

3,590,326
OVERCURRENT PROTECTIVE DEVICE

John D. Watson, Portsmouth, England, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of application Ser. No. 765,582, Oct. 7, 1968, now abandoned. This application June 18, 1970, Ser. No. 47,624
Int. Cl. H01h 47/18
U.S. Cl. 317—36 20 Claims

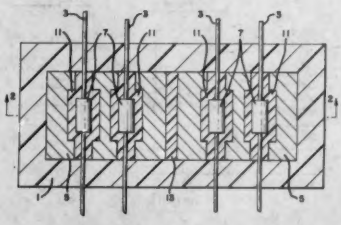


An overcurrent protective device of the time delay type is provided which is responsive to the current in an alternating current circuit which is being protected. When the instantaneous current exceeds a predetermined value as sensed by a level detecting means, the protective device produces an output after a predetermined time delay which may be of a fixed duration or which may vary inversely with the magnitude of the current being sensed. If the instantaneous current decreases below the predetermined value before the end of the predetermined time delay and remains below the predetermined value, the level detecting means after a relatively short time period or interval actuates or resets the protective device to an operating condition which corresponds to the beginning of whatever predetermined time delay is provided in the operation of the overall protective device.

3,590,327
SYSTEM FOR MAINTAINING UNIFORM TEMPERATURE CONDITIONS THROUGHOUT A BODY

Mauricio A. Thomae, Rochester, N.Y., assignor to Transmation, Inc., Rochester, N.Y.

Filed Apr. 24, 1969, Ser. No. 818,869
Int. Cl. H01l 1/10, 1/12
U.S. Cl. 317—100 12 Claims

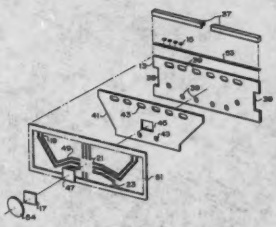


The disclosure relates to a temperature regulating system for maintaining temperatures relatively constant throughout a capsule containing electronic components and for causing gradual change, if any, of temperature caused by changes in the outer environment. This is provided by placing the components in a high thermal conductivity material which is enclosed by a low thermal conductivity material. Electronic components and electrical components are glued and potted in apertures within the interior high thermal conductivity member by means of a substantially electrically nonconducting and thermally highly conductive material such as an epoxy filled with beryllium oxide. According to a second embodiment the inner capsule is molded from a high thermal conductivity ceramic such as aluminum oxide or beryllium oxide. It is also possible to encapsulate the components prior to baking of the ceramic material. According to a third embodiment, the electrical and electronic components are potted directly in a beryllium oxide epoxy which will keep the components mechanically rigid within the potting material. Such a material would have substantially no electrical conductivity and very high thermal conductivity.

3,590,328
MODULE ASSEMBLY AND METHOD OF MAKING SAME

Bert L. Frescura, Los Altos; Nicholas G. Spilling, Sunnyvale, and Harry P. Vossen, Santa Clara, all of, Calif., assignors to Hewlett-Packard Company, Palo-Alto, Calif.

Filed Oct. 29, 1969, Ser. No. 872,204
Int. Cl. H02b 1/00
U.S. Cl. 317—100 10 Claims

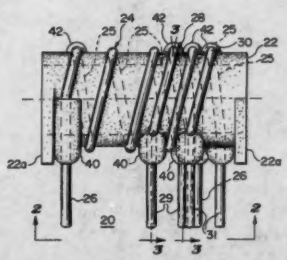


A module assembly includes a sheetlike aluminum substrate, a plurality of semiconductor light emitting elements bonded to one edge of the substrate, and an integrated circuit and metal plane conductor pattern bonded to the lateral surface of the substrate. The conductor pattern and substrate are bonded together by a Teflon FEP coated polyimide film disposed between them. The conductor pattern electrically interconnects the light emitting elements and the integrated circuit and provides input terminals connectable to an external signal source. Selected areas of the module are encapsulated with a very thin layer of silicone compound which is secured to the substrate. The module components are fabricated by bonding and encapsulating steps which permit formation of a thin, mechanically sturdy and integral unit without causing thermal stress in the semiconductor components thereof.

3,590,329
COIL ASSEMBLY AND METHOD OF MAKING THE SAME

James E. Krepps, Jr., Bloomington, Ind., assignor to Sarkes Tarzian Inc., Bloomington, Ind.

Filed May 5, 1969, Ser. No. 821,837
Int. Cl. H02b 1/04; H01f 15/02, 41/02
U.S. Cl. 317—101 9 Claims



A coil assembly and method of making the same comprising an elongated coil form of insulating material, a first coil on the form having a plurality of coaxial turns with selected spacing between adjacent turns, and a second coil having a single turn or less mounted on the coil form in coaxial rela-

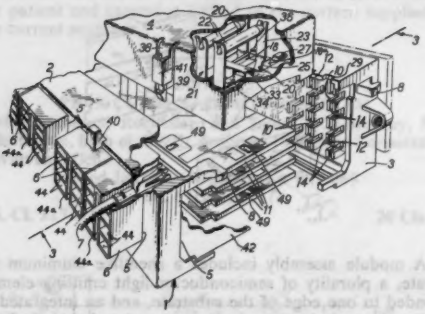
tion with and spaced between a pair of adjacent turns on the first coil. The second coil includes a pair of integral connector leads at opposite ends of the turn which leads extend outwardly of the coil form from between spaced adjacent turns of the first coil. Integral connector leads of the first and/or second coil support the coils in a mold forming member during and after fabrication of the coil form, which is integrally molded to support the coils in fixed mutual inductive relationship.

3,590,330

FUSED PRINTED CIRCUIT BOARD INTERCONNECTOR

Wladimiro Teagno, and Leonardo Santini, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 29, 1969, Ser. No. 828,919
Claims priority, application Italy, May 31, 1968, 1,7231A/68
Int. Cl. H05k *1/04*
U.S. Cl. 317—101 **7 Claims**



A two-part box shell contains a stack of spaced printed circuit boards interconnected at one side of the box by comb-contacts which project above the stack for interconnection by fuses accessible through a cover. Other sides of the box are apertured for receiving multicontact edge connectors engaging the boards of the stack. Harness wires in groups are interconnected through the circuit boards and the fuses in circuit paths determined by the printed circuit patterns which can be changed, for example, to adapt the device to the requirements of specific automobile wiring systems.

3,590,331

PANEL MOUNTED SWITCH ENCLOSURE

Andrew F. Kirsch, Edison, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 2, 1969, Ser. No. 821,373
Int. Cl. A02b *1/10*; H01h *3/12*
U.S. Cl. 317—112 **11 Claims**

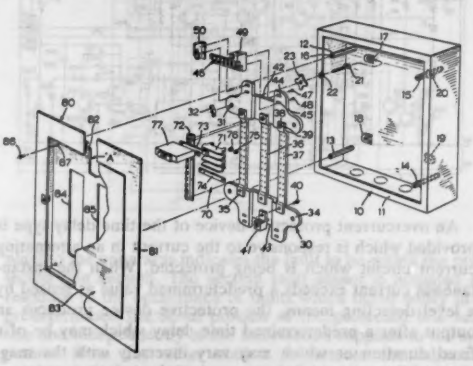
A switch enclosure comprising a broad thin elongated conduit mounted flat against a wall panel can be made of sufficient length to accommodate any desired number of short stroke electrical switches. A standard receptacle which communicates with the conduit and penetrates a standard opening in the panel serves as a conduit for the electrical conductors connected to the switches. Alternatively, the standard receptacle can be made large enough to accommodate other switches too deep to be mounted in the flat conduit.

3,590,332

PANELBOARD WITH INSULATIVE CIRCUIT BREAKER SUPPORTS MOUNTED ON THE BUS BARS

Robert G. Anderson; William M. Donald, and Tony J. Drag, all of Ontario, Canada, assignors to Canadian Westinghouse Company, Limited, Hamilton, Ontario, Canada

Filed Mar. 20, 1969, Ser. No. 808,872
Int. Cl. H02b *1/04*
U.S. Cl. 317—119 **12 Claims**



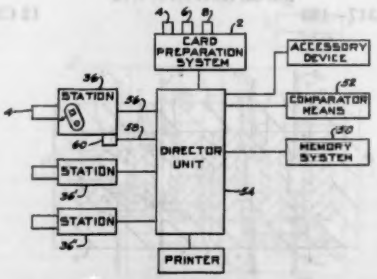
A panelboard comprises an elongated bus bar having insulating breaker support means supported on the bus bar and a plurality of circuit breakers supported in a column with each breaker supported at one end thereof on the insulating breaker support means. The panelboard comprises a stationary part and a movable cover with an improved concealed hinge movably supporting the cover on the stationary part.

3,590,333

IDENTIFICATION SYSTEM

Alvin S. Blum, 700 Palerno Ave., Coral Gables, Fla.

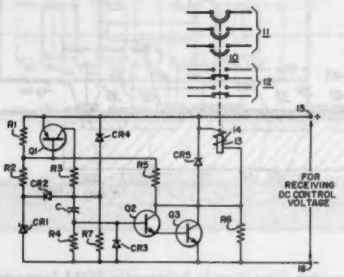
Filed Dec. 31, 1968, Ser. No. 789,052
Int. Cl. E05b *49/00*; H01h *47/22*
U.S. Cl. 317—134 **8 Claims**



An identification system including a card preparation system, a memory system, remote card reading stations, a comparator, accessory device, and a control means connected between each of said items. The card preparation system records distinct patterns on identification cards. The control means directs the operation of the information retrieval system. The memory system stores identifying information characteristics as well as distinct coded patterns that are placed on the cards. The remote card reading stations provide relative movement between the card being read and the reading head in the station in order to generate a train of

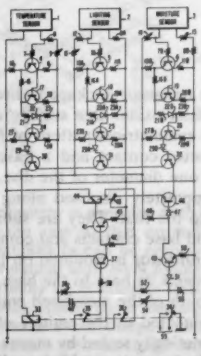
electrical impulses. The comparator compares the train of electrical impulses from a remote station and a train of electrical impulses from the memory system. The comparator signals a match or mismatch to the control means in order to operate various accessory devices.

3,590,334
STATIC ECONOMIZER CIRCUIT FOR POWER CONTACTORS
Donal Eugene Baker, 3898 Neely Road, Lima, Ohio
Filed Oct. 24, 1969, Ser. No. 869,266
Int. Cl. H01h 47/10
U.S. Cl. 317—148.5 R **3 Claims**



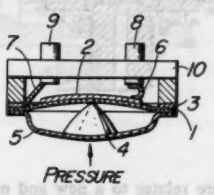
An economizer circuit that can close a power contactor with high current through a relay coil quickly and then go to a state of low holding current with low power dissipation is provided using transistor switching elements of which a first responds to a DC control voltage to turn on when a voltage signal of predetermined polarity and magnitude is applied and at least a second transistor responds to the output current of the first transistor to apply a feedback signal to drive the first transistor rapidly to full saturation. A capacitor charging by the output current of the first transistor controls the period of saturation of the second transistor holding the second transistor on until the capacitor is almost fully charged. During the brief saturation period a pulse of high current is developed through the relay coil to effect accelerated closure of the power contactor. After closure, when the transistors are not in saturation, an economical holding current is provided through the relay coil.

3,590,335
AUTOMATIC CONTROL DEVICE FOR IRRIGATING, SPRAYING AND SPRINKLING
Claude R. Tetar, Paris, France, assignor to L'Electronique Appliquee, Montrouge, France
Filed Dec. 8, 1969, Ser. No. 883,098
Claims priority, application France, Dec. 10, 1968, P.V.177,380
Int. Cl. H01h 47/32
U.S. Cl. 317—148.5 **12 Claims**



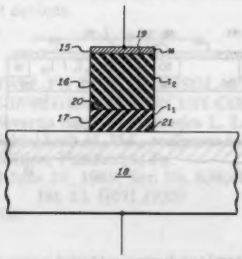
Apparatus for the automatic control of irrigating or spraying or sprinkling devices includes electrical sensors which are independently responsive to temperature, ambient lighting and actual moisture content of the soil. The output of these sensors is compared to preset reference standards and the resulting signals used to control the application of water to the soil or plants or trees.

3,590,336
BENDING FORCE SENSITIVE MECHANO-ELECTRICAL CONVERTING DEVICE EMPLOYING A SEMICONDUCTOR DIAPHRAGM
Akio Yamashita, and Takehiro Tsuzaki, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 23, 1968, Ser. No. 731,384
Claims priority, application Japan, May 26, 1967, 42/33850
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R **3 Claims**



A mechano-electrical converting device comprising a semiconductor wafer doped with a deep level impurity and having a thickness of 100 microns or less, and at least two electrical connections. When a bending stress is given to the semiconductor wafer, the electrical resistance thereof varies markedly.

3,590,337
PLURAL DIELECTRIC LAYERED ELECTRICALLY ALTERABLE NON-DESTRUCTIVE READOUT MEMORY ELEMENT
Horst A. R. Wegener, Carlisle, Mass., assignor to Sperry Rand Corporation
Filed Oct. 14, 1968, Ser. No. 767,230
Int. Cl. H01c 7/14
U.S. Cl. 317—234 R **3 Claims**



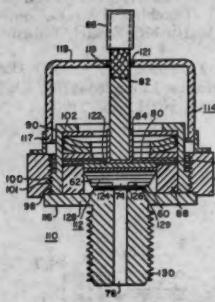
A memory element comprising a semiconductor substrate and a conductive electrode separated from said substrate by a plurality of dielectric layers of different conductivities. The "write-in" and "storage time" characteristics of the memory element are determined by the permittivity, the electric field and the current density versus electric field characteristic of the most conductive dielectric layer. The ratio of the conductivities of the most conductive dielectric layer to a contiguous dielectric layer is more than 2. The current density versus electric field characteristic of each dielectric layer is highly nonlinear. One form of the invention is a capacitor; another form is a field effect transistor utilizing said capacitor as the gate electrode structure.

3,590,338

LIGHT ACTIVATED SEMICONDUCTOR DEVICE

John S. Roberts, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 28, 1969, Ser. No. 880,842
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 R 10 Claims



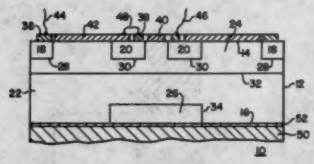
This disclosure relates to a new and novel encapsulating package for a light-activated or light-sensitive semiconductor device. The various problems associated with introducing light through the top or cap of the encapsulating case especially the establishment of a hermetic seal are overcome by introducing light through an aperture in the base member of the case and establishing a hermetic seal by employing a soft silver layer which is disposed on the surface of the base member in contact with the semiconductor wafer.

3,590,339

GATE CONTROLLED SWITCH TRANSISTOR DRIVE INTEGRATED CIRCUIT (THYTRAN)

William J. Bilo, Irwin, and John W. Motto, Jr., Greensburg, both of, Pa., assignors to Westinhouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1970, Ser. No. 007,077
Int. Cl. H01l *19/00, 11/10*
U.S. Cl. 317—235 R 12 Claims



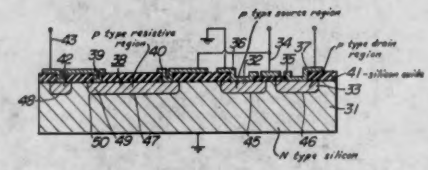
A body of semiconductor material comprises a controlled rectifier switch and a transistor each sharing a common anode. The controlled rectifier provides the base drive which is necessary to keep the transistor in an "on" condition. Once operating, the transistor functionally does not see the controlled rectifier in the electrical circuit. When it is desired to shut off the transistor, the necessary signal is sent to the gate region of the controlled rectifier and the rectifier is turned off thereby removing the base drive from the base region of the transistor which in turn turns all of the regions of the transistor off substantially simultaneously. This type of device is designated by the term "THYTRAN."

3,590,340

BREAKDOWN PREVENTING CIRCUIT AND AN INTEGRATED DEVICE THEREOF FOR A SEMICONDUCTOR DEVICE HAVING AN INSULATE GATE ELECTRODE

Masaharu Kubo, Kokubunji-shi; Hiroto Kawagoe, Kodaira-shi; Teruo Furuya, Kodaira-shi, and Yoshikazu Hatsukano, Kodaira-shi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1968, Ser. No. 707,858
Claims priority, application Japan, Feb. 27, 1967, 42-12087
Int. Cl. H01l *19/00;* H01c *7/14*
U.S. Cl. 317—235 R 22 Claims



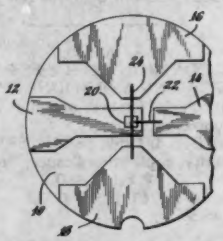
A circuit and an integration thereof for preventing the breakdown of an oxide film in an MOS type field effect transistor, wherein a resistor is connected between a metal gate electrode and a protecting diode (clamp diode).

3,590,341

MICROWAVE TRANSISTOR PACKAGE

William H. Preston, Watchung, N.J., assignor to KMC Semiconductor Corporation, Long Valley, N.J.

Filed Aug. 19, 1968, Ser. No. 753,367
Int. Cl. H01l *1/08, 1/14*
U.S. Cl. 317—235 8 Claims

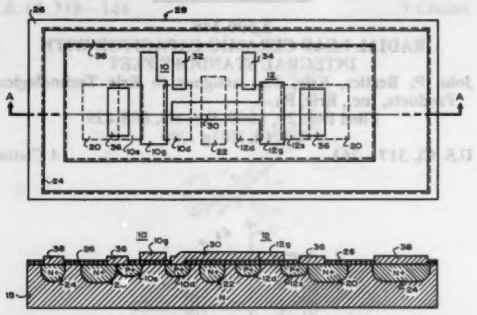


A microwave transistor package is disclosed which utilizes a disc of beryllium oxide. One surface of the disc is metallized to form a symmetrical pattern of four contacts. These include a collector contact and a base contact oppositely disposed along one diameter of the disc. The remaining two contacts are oppositely disposed along a second diameter perpendicular to the first. They are substantially wider than the collector and base contacts and comprise double emitter contacts. The transistor is mounted on the collector contact and a wire connects its base to the base contact. An emitter wire connects both of the metallized emitter contacts and its midpoint is connected to the emitter of the transistor. The package is hermetically sealed by means of a beryllium oxide cap enclosing the transistor and "glassed" to the disc.

3,590,342
MOS INTEGRATED CIRCUIT WITH REGIONS OF GROUND POTENTIAL INTERCONNECTED THROUGH THE SEMICONDUCTOR SUBSTRATE

Hans J. Jekat, Redwood City, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 6, 1968, Ser. No. 773,737
Int. Cl. H01l 11/14
U.S. Cl. 317—235 3 Claims

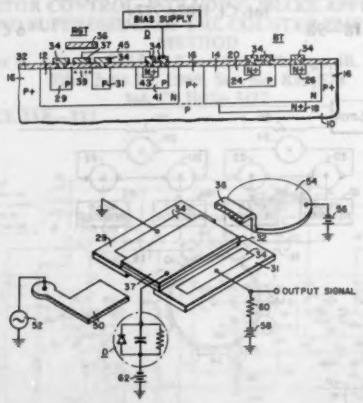


In a P-channel MOS integrated circuit each active P^+-type region to be operated at ground potential is connected by a conductor to an adjacent N^+-type region in the N-type substrate thereby interconnecting these active regions through the substrate.

3,590,343
RESONANT GATE TRANSISTOR WITH FIXED POSITION ELECTRICALLY FLOATING GATE ELECTRODE IN ADDITION TO RESONANT MEMBER

Harvey C. Nathanson, Pittsburgh; John R. Davis, Jr., Export, and Terence R. Kiggins, Latrobe, all of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1969, Ser. No. 795,671
Int. Cl. H01l 11/14
U.S. Cl. 317—235R 6 Claims

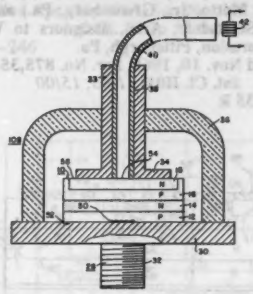


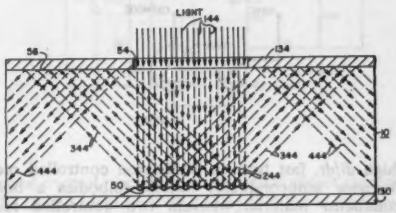
A resonant gate transistor is provided with a gate electrode with means to bias the gate so that normally off detectors such as P-channel MOSFETs can be employed, such detectors being more compatible with NPN bipolar transistors for integration than normally on N-channel detectors. The gate electrode is preferably biased by a floating diode of very small capacitance so as to avoid charge leakage and reduced gain. The gate electrode permits large area electrostatic coupling with the vibratory member.

3,590,344
LIGHT ACTIVATED SEMICONDUCTOR CONTROLLED RECTIFIER

John S. Roberts, Export, and Daniel R. Muss, Pittsburgh, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1969, Ser. No. 834,997
Int. Cl. H01l 11/10
U.S. Cl. 317—235 9 Claims



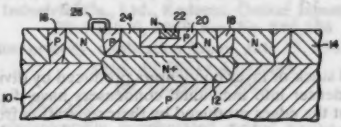


This disclosure is concerned with a four region light activated controlled rectifier. The controlled rectifier, which comprises in part a body of silicon having four alternate regions of opposite type conductivity, the two end regions being emitter regions and two middle regions being base regions, is "turned-on" by light. The light enters at one major surface of the body passes entirely through the body to the opposed major surface where reflective means causes the light to pass back through the body. The reflection of the light causes the rectifier to be "turned-on" faster than possible with prior art devices.

3,590,345
DOUBLE WALL PN JUNCTION ISOLATION FOR MONOLITHIC INTEGRATED CIRCUIT COMPONENTS

Joe E. Brewer, Severna Park, and Charles L. Laughinghouse, Linthicum Heights, both of, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 25, 1969, Ser. No. 836,481
Int. Cl. H01l 19/00
U.S. Cl. 317—235R 2 Claims



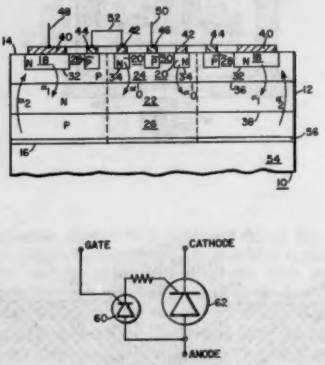
Described is a system for electrically isolating discrete components of a monolithic integrated circuit one from the other by a pair of spaced diffused walls of the same conductivity type as the substrate for the integrated circuit and sur-

rounding a discrete circuit component such as a transistor, diode or resistor. The inner diffused wall is electrically shorted to the material into which it is diffused to greatly reduce the gain of substrate parasitic transistor configurations and to reduce lateral parasitic transistor currents.

3,590,346
HIGH D/D, FAST TURN-ON DARLINGTON CONTROLLED SEMICONDUCTOR SWITCH

William J. Bilo, Irwin, Pa.; Nicholas Ernick, Jr., Greensburg, Pa.; John W. Motto, Jr., Greensburg, Pa., and Thorndike C. T. New, Scottsdale, Ariz., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1969, Ser. No. 875,354
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **14 Claims**

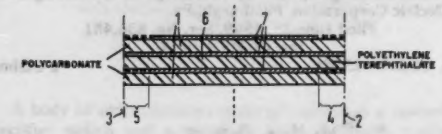


A high *di/dt*, fast turn-on Darlington controlled rectifier semithyristor semiconductor switch embodies a body of semiconductor material wherein two controlled rectifier switches are formed, each having a separate gate and a separate cathode but both sharing a common anode. The cathode current of one controlled rectifier switch is the gate current for the second controlled rectifier switch thereby enabling a small initial current to be amplified and turn-on a larger controlled rectifier switch whereby the overall effect is a fast turn-on gate controlled switch with a high *di/dt* rating.

3,590,347
ELECTRICAL STACK AND LAYER CONSTRUCTION

Heinrich Gottlob, Regensburg, and Gerhard Hoyler, Muenchen both of, Germany, assignors to Siemens Aktiengesellschaft

Filed June 18, 1969, Ser. No. 834,248
Claims priority, application Germany, June 25, 1968, P 17 64 549.7
Int. Cl. H01g *3/06*
U.S. Cl. 317—258 **8 Claims**

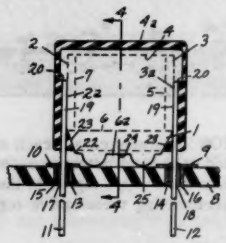


Electrical stack or layer condensers produced by dividing a master condenser into individual condensers have dielectric properties at the edges produced by their separation from the master condenser, which properties are substantially the same as those portions of the condensers intermediate the edges. The individual condensers are produced by breaking up the metallic coatings on the individual dielectric layers adjacent the edges formed during separation from the master condenser. In one embodiment, the individual dielectric layers are of a cast plastic material containing about 0.25 percent solvent residues. The heat buildup during cutting to separate the individual condensers and the solvent residues permit breakup of the metallic coating adjacent the edge being formed to provide a dielectric condition at the new edge which prevents arcing of oppositely poled layers along the new formed edges. Another embodiment employs metallic coated layers of plastic, alternately cast and extruded foils, to improve the regenerative properties of the condenser and to prevent arcing or breakdown at the edges of the individual condensers.

3,590,348
RADIAL LEAD CERAMIC CAPACITOR WITH INTEGRAL STANDOFF FEET

John P. Bertics, Erie, Pa., assignor to Erie Technological Products, Inc., Erie, Pa.

Filed Dec. 29, 1969, Ser. No. 888,429
Int. Cl. H01g *1/00*
U.S. Cl. 317—261 **4 Claims**

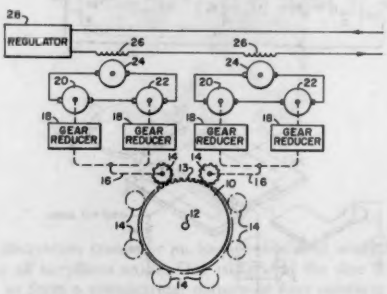


Ceramic disc capacitors for printed circuit boards having radial leads in the plane of the disc and integral standoff feet between the leads.

3,590,349
VOLTAGE UNBALANCE DETECTOR FOR SERIES-CONNECTED MOTORS DRIVEN BY A COMMON POWER SOURCE

Mohammed Safiuddin, North Tonawanda, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 2, 1969, Ser. No. 821,372
Int. Cl. H02p *7/74*
U.S. Cl. 318—98 **6 Claims**



Described is a system for detecting the absence of a load on one of the two drive motors connected in series across a common source of driving potential. This is accomplished by connecting an electrical condition detection device, for example a low amperage circuit breaker, across both motors whereby shunt currents tending to flow around the respective motors and through the breaker will normally oppose each other and prevent tripping of the breaker. However, when the load on one of the motors is removed because of breakage of a pinion gear or the like, the voltages across the

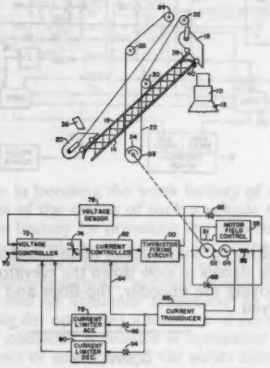
motors become unbalanced, the opposing currents tending to flow through the circuit breaker are no longer equal, and the breaker is caused to trip.

3,590,350

MOTOR CONTROL FOR SKIP HOIST DRIVE SYSTEMS AND THE LIKE

William A. Munson, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1968, Ser. No. 756,652
Int. Cl. H02p 5/44
U.S. Cl. 318—144 7 Claims



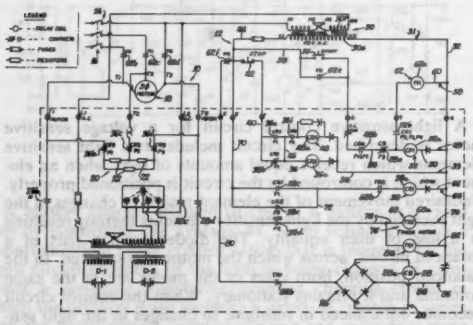
Described is an electrical motor control for skip cars of the type utilized to charge materials into a blast furnace, and for other similar applications, wherein a first current or torque limit of the motor is provided under decelerating conditions and a second and different current or torque limit is provided under accelerating conditions. This tends to equalize the pulling forces in the cables which elevate the skip cars under deceleration and under acceleration conditions and reduces strains in the skip bridge and associated structural elements of the blast furnace.

3,590,351

MOTOR CONTROL, INCLUDING BRAKE APPLYING, AND SUPPRESSING OF THE COUNTER EMF, AND METHOD

Arthur K. Littwin, 2235 N. Knox Ave., Chicago, Ill.

Filed June 23, 1969, Ser. No. 835,578
Int. Cl. H02p 3/22
U.S. Cl. 318—211 10 Claims



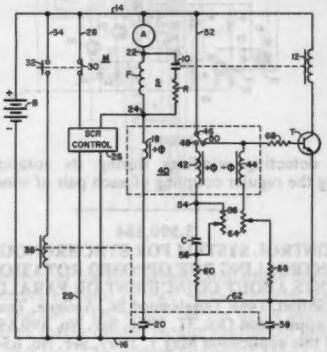
Includes resistors and circuitry for connecting them across the motor winding, means holding the circuitry open during normal operation of the motor, a STOP switch for stopping the motor, and means operative on actuation of that switch for connecting the resistors in the circuitry, and thereafter opening the motor drive circuit, whereby the counter e.m.f. is directed through the resistors.

3,590,352

FIELD WEAKENING CIRCUIT FOR A SERIES FIELD MOTOR

Robert G. Ries, Milwaukee, and Kenneth W. Retzer, Wauwatosa, both of, Wis., assignors to Square D. Company, Park Ridge, Ill.

Filed Apr. 28, 1969, Ser. No. 819,925
Int. Cl. H02p 5/06
U.S. Cl. 318—246 8 Claims



A speed control circuit for a series field direct current motor. The circuit includes a reed relay that has a movable contact responsive to the current flow through the field and a resistance in a shunt circuit with the field. The reed relay through a transistor and a contactor causes the shunt circuit to be interrupted when the current flow through the motor increases above the predetermined value. The reed relay has a pair of coil windings arranged so that one of the windings generates a magnetic flux that opposes the flux generated by the current flow through the field and the other provides an output flux which adds to the flux generated by the field current so that movable contact will operate with a snap action. The flux outputs of each of the pair of coils is individually adjustable so the response of the relay to the upper and lower limits of a range of field current flow may be individually adjusted. The circuit further includes a capacitor which will cause the flux output of one of the coils to momentarily increase when the reed relay initially responds to an excess current in the field circuit.

3,590,353

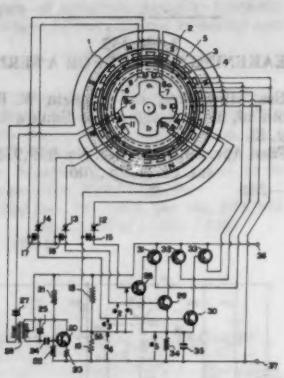
ELECTRONICALLY COMMUTATED MOTOR HAVING AN OUTSIDE ROTOR AND AN INSIDE POSITION DETECTOR

Kazutsugu Kobayashi; Hisayuki Matsumoto, and Yoshiaki Igarashi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed July 9, 1969, Ser. No. 840,156
Claims priority, application Japan, July 15, 1968, Oct. 9, 1968, 43/50314;43/74084
Int. Cl. H02k 29/00
U.S. Cl. 318—254 5 Claims

An electronically commutated motor having a multiple pole permanent magnet rotor. A position detecting means is located inside of the stator. This arrangement makes it easy to fabricate the stator and the position detecting means from the same sheet of laminated magnetic material with little material loss. A position detecting rotor having a plurality of

teeth with short-circuited conductors thereon modulates the coupling between the primary and secondary windings in the



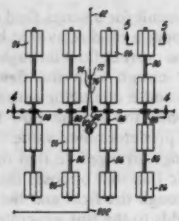
position detecting windings during its rotation without disturbing the regular coupling of each pair of windings.

3,590,354

CONTROL SYSTEM FOR SYNCHRONOUSLY CONTROLLING THE OPPOSED ROTATION OF ELEMENTS ABOUT COINCIDENT OR PARALLEL AXES

Foey M. Shiflet, 1466 Tanglewood St., Abilene, Tex.

Original application Oct. 31, 1966, Ser. No. 590,698. Divided and this application May 1, 1969, Ser. No. 854,330
Int. Cl. H02p *3/00*
U.S. Cl. 318—265 6 Claims



A control system for controlling and synchronizing the rotational movement of a pair of rotatable sound controlling elements, including a substantially instantaneously reversible motor which drives a takeup drum. A main drive cable is connected to the drum for winding up or leading out, and local control flexible lines or elements are connected between the main drive cable and the sound controlling elements to uniformly and simultaneously move these elements in opposite rotational directions from each other about parallel or coincident rotational axes. The system further includes a sound sensing or detecting device which responds to variations in sound caused by movement of the sound controlling elements to deenergize the motor when the sound controlling elements have been moved by the system to an optimum position.

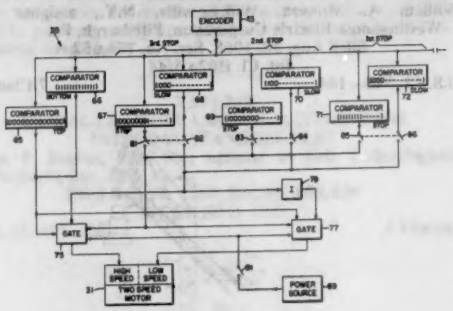
3,590,355

DIGITAL POSITIONING MOTOR CONTROL FOR AN ELEVATOR

Lanny L. Davis, and Wilmer G. Radke, both of Bremerton, Wash.

Filed Oct. 22, 1969, Ser. No. 868,329
Int. Cl. G05b *19/28*
U.S. Cl. 318—602 3 Claims

An elevator control system having an encoder connected to the elevator cable drum shaft that provides output signals indicating the exact position of elevator travel. The output of the encoder is sensed by a plurality of comparators which provide output signal at top and bottom maximum travel positions and various intermediate positions. At a predeter-



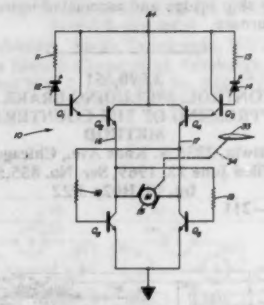
mined distance on both sides of these positions, the comparators provide signals to slow down the elevator. Speed control logic employing the encoder, flip-flops and a comparator is also employed.

3,590,356

LIGHT SENSITIVE SERVOMOTOR CONTROL CIRCUIT

Laurence C. Hofmeister, Fort Lauderdale, Fla., assignor to The Bendix Corporation

Filed Feb. 17, 1969, Ser. No. 799,775
Int. Cl. G05b *1/06*
U.S. Cl. 318—640 1 Claim

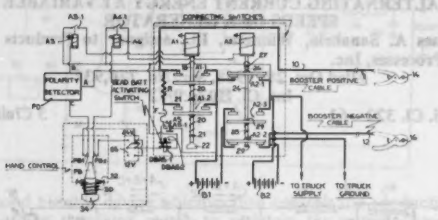


A light sensitive control circuit for a voltage sensitive motor is described. The circuit includes two light sensitive elements which receive equal amounts of light when an element which is controlled by the circuit is positioned properly. Undesired movement of the element results in changes in the light received by the light sensitive elements thereby resulting in a loss of their equality. The diodes form a part of a balanced circuit, across which the motor is connected. In the balanced position, both sides of the motor are at the same potential and it remains stationary. When the control circuit becomes unbalanced in response to changes in the light sensitive elements, the motor is connected across a potential difference and rotates in a direction dictated by the direction of the potential difference. Rotation of the motor corrects the position of the element under control and simultaneously equalizes the light impinging upon the light sensitive elements and thereby rebalances the control circuit.

3,590,357
BATTERY BOOSTER

Donald Reid, 4909, Clanranald Avenue, Notre-Dame-de-Graces, Montreal 248, Quebec, Canada

Filed Nov. 5, 1969, Ser. No. 874,312
Int. Cl. H02j 7/00
U.S. Cl. 320—7 9 Claims

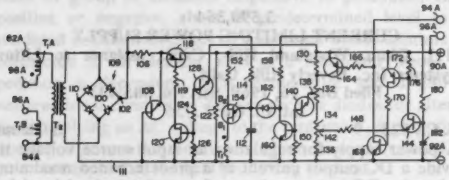


A system for use in boosting the weak battery of a vehicle to permit operation of the starter of such a vehicle including at least one booster battery for providing the required energy for boosting the weak battery. The circuit for connecting the booster battery to the weak battery of the vehicle includes a relay having an electromagnetic winding connected to an energizing circuit and an armature responsive to the electromagnetic winding for operating a main set of contacts and an auxiliary set of contacts. A resistor is connected in series with the auxiliary set of contacts and the series combination of said auxiliary set of contacts and said resistor is connected in parallel with said main set of contacts. The booster battery is connected to the weak battery through said sets of main and auxiliary contacts and the armature of the relay is designed in such a way as to close said auxiliary set of contacts ahead of said main set of contacts and to open said auxiliary set of contacts after said main set of contacts so as to prevent arcing at the terminals of said main set of contacts due to the energy stored in the starter of the vehicle.

3,590,358
ELECTRONIC BATTERY CHARGER

Murray A. Ruben, Belmont, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

Filed Jan. 2, 1968, Ser. No. 694,968
Int. Cl. H02j 7/10
U.S. Cl. 320—39 9 Claims

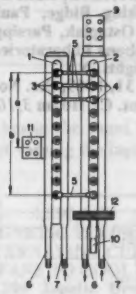


A battery charger adapted to charge a battery at a rapid rate by controlling the average AC input voltage through a nonsymmetrical phase control action that is triggered by the open circuit potential of the battery being charged. It comprises a two-stage transformer-coupled charging circuit in which the primary stage includes a gated AC switch in series with the transformer's primary winding and secondary stage includes a full wave rectifier with output terminals adapted to be connected to the battery to be charged. The switch is closed on each half cycle by gating pulses generated by a phase control circuit which senses the state of charge of the battery by measuring its open circuit potential.

3,590,359
CURRENT CONVERTER FOR TRANSFORMING THREE-PHASE ALTERNATING CURRENT INTO DIRECT CURRENT

Hans Jurg Bossi, Nussbaumen, and Manfred Quissek, Villigen, both of, Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Dec. 5, 1969, Ser. No. 882,643
Claims priority, application Switzerland, Dec. 24, 1968, 19233/68
Int. Cl. H02m 7/06
U.S. Cl. 321—8 3 Claims

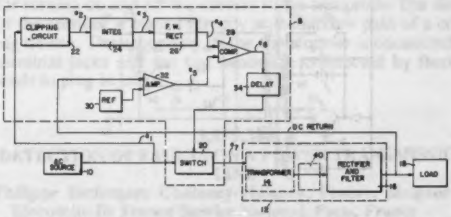


A current converter for converting three-phase alternating current into direct current, or vice versa, includes for each phase an AC bus bar, a DC shunt bus bar and a plurality of current converter valves carried by and distributed uniformly along the AC bus bar. The current converter valves are connected electrically in parallel between the AC and DC bus bars of each phase, and the DC bus bars of all three phases are interconnected at each end thereof by conductor paths which have an ohmic resistance (as measured between valve junctions nearest to the associated junction on the DC bus bars associated with two different phases) which is always less than one-fifth of the ohmic resistance of one bus bar (as measured between the outermost positioned valves on the bus bar). Also the distance between the centerline of an AC junction on the AC bus bar and the outermost valve junction thereon (nearest to the direct current terminal structure formed from the interconnection at one end of the DC bus bars) amounts to from 60 to 75 percent of the distance between the two outermost valve junctions on the AC bus bar.

3,590,360
HIGH EFFICIENCY AC VOLTAGE REGULATOR

Charles M. Puckette, Mont Vernon, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 18, 1968, Ser. No. 776,551
Int. Cl. H02m 1/08
U.S. Cl. 321—18 10 Claims



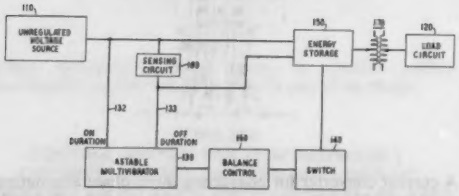
A voltage regulator serving a DC power supply controls the peak voltage of an input AC waveform by momentarily opening a switch connected in series with the AC source during periods when the input voltage exceeds a desired

reference voltage related to the output voltage of the supply. The action of the switch creates notches centered in each half cycle of the AC waveform whose width is inversely related to the magnitude of the peak voltage applied to the DC supply and to the output voltage applied to the load. Control of the average or RMS voltage, as well as random peak voltages, may also be accomplished using a similar technique.

3,590,361
DC TO DC CONVERTER INCLUDING SWITCHING DEVICE HAVING ITS ON AND OFF TIMES INDEPENDENTLY CONTROLLED BY THE LINE AND LOAD VOLTAGES, RESPECTIVELY

John D. Bishop, Basking Ridge; Paul Mischenko, Morris Plains, and Roman Ostapiak, Parsippany, all of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkely Heights, N.J.

Filed Dec. 31, 1969, Ser. No. 889,529
Int. Cl. H02m 3/10
U.S. Cl. 321—19 **8 Claims**

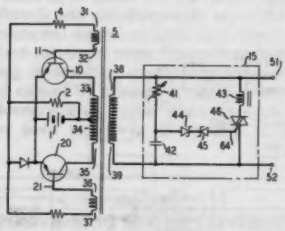


The duty cycle of the switching transistor in a DC to DC converter is controlled by an astable multivibrator whose alternate switching states are respectively responsive to the line and load voltages. Feedback of the output voltage to control the duration of one state of the multivibrator is obtained from the primary of the converter output transformer whose magnetic energy level is not allowed to fully dissipate in any one operating cycle. A balancing circuit arrangement is utilized to minimize variations in the base drive signal of the switching transistor and to prevent it from saturating to eliminate variations in the duration of the conducting state of the transistor due to charge storage.

3,590,362
DC TO DC CONVERTER CIRCUIT WITH LOAD VOLTAGE REGULATION UTILIZING A CONTROLLED SIMULATED SATURATING CORE

Robert J. Kakalec, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 24, 1969, Ser. No. 860,503
Int. Cl. H02m 7/48
U.S. Cl. 321—45 R **8 Claims**

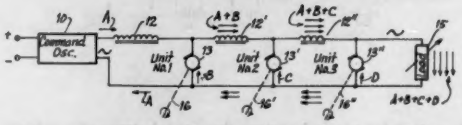


An inverter circuit driving a ferroresonant regulator utilizes a feedback controlled switching frequency arrangement to regulate its output voltage with respect to both line and load conditions. A deviation in the output voltage alters the switching frequency of the inverter by altering the simulated saturation of a switching control transformer core included in the inverter circuit. The output voltage of the ferroresonant regulator, which is proportional to the inverter frequency, is adjusted to some regulated value. Saturation of the inverter transformer is simulated by controlling the volt-time area of the output voltage waveform of the inverter transformer.

3,590,363
GENERATION OF CONSTANT FREQUENCY ALTERNATING CURRENT ENERGY AT VARIABLE SPEEDS OF A GENERATOR

Ulises A. Sanabria, Wilmette, Ill., assignor to Products & Processes, Inc.

Filed Oct. 28, 1968, Ser. No. 770,932
Int. Cl. H02p 9/42
U.S. Cl. 322—61 **3 Claims**



This invention is directed to the generation of fixed frequency alternating current for power purposes from a dynamoelectric machine driven at substantially different speeds. This is accomplished through the use of a series-wound DC motor laminated in accordance with good transformer design. The field of the motor is excited with a current of the desired frequency and approximate voltage of the desired output and the armature is rotated externally in excess of its normal speed as a motor to generate a voltage across its brush terminals which terminals are set in the neutral position as is common in a reversing series motor. The output voltage increases with load increase across the brush terminals until a maximum voltage is soon attained, e.g. 110 volts at no load; 112 volts with 200 watts load; 116 volts with a load of 600 watts and 117 volts with loads from 800 watts to 2.5 kilowatts after which the voltage gradually drops to about 110 at 4 kilowatts. As in an autotransformer the input power, except the I^2R loss, reappears in the output load along with the output of the power generated in the armature. Therefore the variable armature flux, rather than being wasted as in common alternators, generates available current in the field. Inasmuch as the output is always in phase with the input the dynamo may be considered an auto or synchropolar generator. The cascading of two or more of these generators provides a spectacular advantage in that the power developed in each stage is added to the power of the output system resulting in an order of magnitude performance improvement.

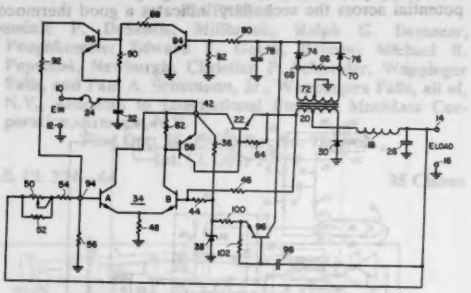
3,590,364
CURRENT LIMITING POWER SUPPLY

Neil I. Okun, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 16, 1969, Ser. No. 885,433
Int. Cl. G05f 1/56
U.S. Cl. 323—9 **6 Claims**

A power supply for regulating an input source voltage to provide a DC output current of a predetermined maximum level and a DC output voltage of a predetermined level including a transistor switch, a transformer and a filter connected in series between input and output terminals. Current flows through the primary winding of the transformer thereby inducing a voltage on a secondary winding proportional to the output current level of the power supply. The proportional voltage actuates a first bistable device to a first or second stable state to generate a control signal depending upon the output current being above or below a predetermined maximum level. Voltage regulation is accomplished by comparing variations in the output voltage with a reference voltage to produce an error signal, the error signal actuating a second bistable device to a first and second stable state depending upon the output voltage level being above or below the predetermined level, the second bistable device controlling the transistor switch conductivity or nonconductivity

to maintain the predetermined voltage. Current limiting is accomplished by utilizing the first bistable device to control the second bistable device which in turn controls the conductivity of the transistor switch to maintain the output current level below the predetermined maximum level.



3,590,365

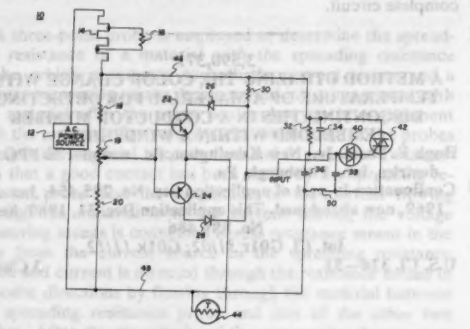
TEMPERATURE CONTROL APPARATUS

Raymond L. Nelson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 3, 1969, Ser. No. 854,993

Int. Cl. G05f *1/44*

U.S. Cl. 323—19 **7 Claims**



Apparatus for controlling the energization of a heat producing element in response to the electrical output derived from a temperature sensitive element such as a thermister. More particularly, the apparatus includes an element or group of elements responsive to potentials, either positive or negative, above a predetermined level to be rendered conductive, a pair of transistors whose emitters are connected to an element such as a thermister whose impedance is dependent upon temperature and a pair of unidirectional conducting devices such as diodes for alternatively applying an AC voltage to the transistors. A potential is developed across the thermister, which serves to control the potential applied to the heat producing element.

3,590,366

VARIABLE ATTENUATOR

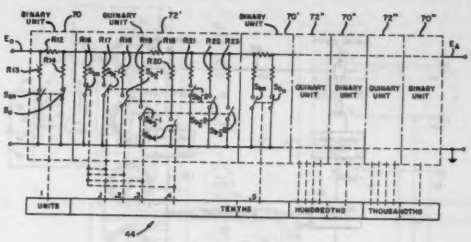
Eldon D. Vaughn, Berkeley, Calif., and Eldon D. Vaughn, Berkeley, Calif., assignors to American Optical Corporation, Southbridge, Mass. and American Optical Corporation, Southbridge, Mass.

Original application Nov. 18, 1966, Ser. No. 595,528, now abandoned. Divided and this application June 27, 1969, Ser. No. 851,522

Int. Cl. H03k *13/02, 13/02*

U.S. Cl. 323—74 **14 Claims**

A dual beam spectrophotometer converts analog signals from beam detectors to a digital output proportional to the logarithm of the ratio of the analog signals. A variable attenuator for use in the converter has a plurality of resistor pi networks, each network having a series branch and a pair of shunt branches. Switches in the shunt branches attain variable attenuation without varying the input resistance of the attenuator.



3,590,367

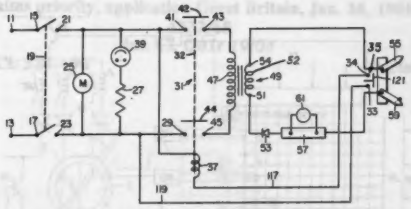
PORTABLE MAGNETIC TEST APPARATUS FOR CONVERTING ALTERNATING CURRENT TO DIRECT CURRENT WITH MEANS TO COOL THE COMPONENTS

Willie P. Ptomey, 2294 Janette Drive, Napa; Leland E. Broyles, 1066 Ross Circle, Napa, Calif., and James E. Hein, 301 Dryden Drive, Vallejo, Calif.

Continuation-in-part of application Ser. No. 676,302, Oct. 18, 1967. This application Mar. 24, 1969, Ser. No. 809,879

Int. Cl. G01r *33/12*

U.S. Cl. 324—38 **1 Claim**



A small, lightweight, compact, portable magnetic particle inspection unit having a full-time use duty cycle that delivers at least 400 amperes of half-wave direct current to a pair of test prods. The unit includes a transformer having a high voltage primary winding and a low voltage secondary winding that is connected to the test prods. A rectifier is provided for converting the secondary winding low voltage alternating current to pulsating direct current. A relay having a relay coil is connected in series with the primary winding and a switch is provided in series with the relay coil. The test prods are supported in a spaced apart position and the switch is supported near the test prods to provide a convenient method for turning on and off the current in the test prods. The diode of the rectifier is placed directly in the airflow path of a cooling device. The secondary of the transformer is connected to terminal jacks and the test prods are connected by flexible leads to plug in jacks.

3,590,368

DETECTION OF FAULTS ON A POWER TRANSMISSION LINE

Philippe Esclangon, Chatenay-Malabry, France, assignor to Electricite De France Service National, Paris, France

Filed Jan. 17, 1969, Ser. No. 791,967

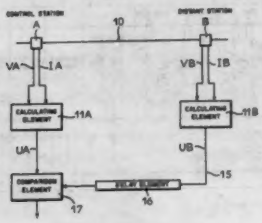
Claims priority, application France, Jan. 24, 1968, 137,176

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **4 Claims**

Faults occurring in a power transmission line connected between two stations are detected by deriving, at each sta-

tion, a test quantity obtained by subtracting a signal equal to the current level at that station multiplied by the characteristic impedance of the transmission line from a signal equal to the voltage level on the line at that station, by modifying one of the test quantities by multiplying it by the



propagation factor of the transmission line, and by comparing such modified test quantity with the other test quantity. If the comparison reveals that the compared quantities are essentially equal, this indicates that no fault exists in the transmission line, whereas the existence of an inequality between the compared quantities indicates that a fault is present.

3,590,369

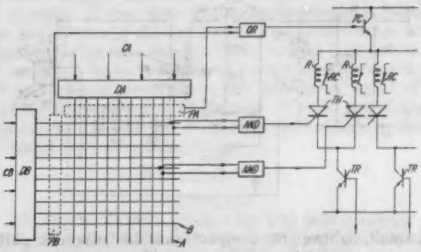
SWITCHING MEANS FOR AUTOMATIC TESTING EQUIPMENT

Charles T. Wainwright, Stevenage, England, assignor to British Aircraft Corporation Limited, London, England

Filed Feb. 14, 1969, Ser. No. 799,351

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **3 Claims**



An automatic testing equipment includes a matrix having two groups of conductors. Energization of any pair of conductors, one in each group, from a pair of binary signal decoding heads is effective to energize a circuit for closing a particular relay associated with the crossing point of the energized conductors, there being a plurality of such relays, one for each test to be performed. The equipment includes a scanning means for scanning the two groups of conductors of the matrix to produce an error signal in the event that more than one conductor of either group is energized at the same time. An inhibit circuit for the relays is energized by such error signal.

3,590,370

METHOD AND APPARATUS FOR DETECTING THE OPEN-CIRCUIT CONDITION OF A THERMOCOUPLE BY SENDING A PULSE THROUGH THE THERMOCOUPLE AND A REACTIVE ELEMENT IN SERIES

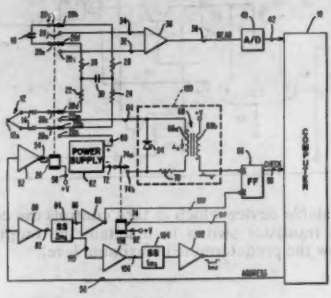
Donald W. Fleischer, Ambler, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Apr. 9, 1969, Ser. No. 818,466

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **3 Claims**

A pulse is sent serially through the thermocouple and the primary of a pulse transformer. The pulse has a duration longer than that sufficient to charge the distributed capacity in the thermocouple and leadwire. At the end of the pulse period the thermocouple is disconnected and the transformer primary is provided with a discharge path. The resulting potential across the secondary indicates a good thermocouple. If that potential does not appear, an open circuit is indicated. The transformer can be replaced by a capacitor which becomes charged only when the thermocouple is a complete circuit.



3,590,371

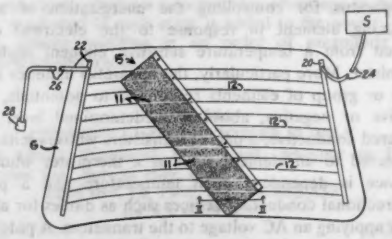
A METHOD UTILIZING THE COLOR CHANGE WITH TEMPERATURE OF A MATERIAL FOR DETECTING DISCONTINUITIES IN A CONDUCTOR MEMBER EMBEDDED WITHIN A WINDSHIELD

Hugh E. Shaw, Jr., New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 795,454, Jan. 31, 1969, now abandoned. This application Dec. 31, 1969, Ser. No. 889,486

Int. Cl. G01r *31/02*; G01k *11/12*

U.S. Cl. 324—51 **3 Claims**

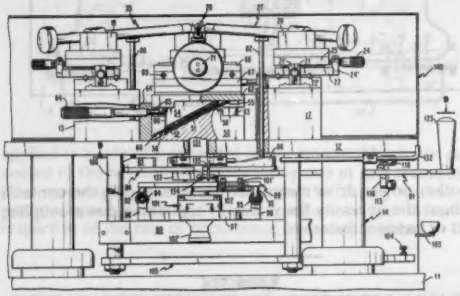


Circuit discontinuities in conductor members embedded in pieces of glass, such as windshields, are detected by placing in operative association with the glass a stratum of cholesteric-phase liquid-crystal material having appropriate color-change temperature-range characteristics. When current is passed through the conductors, color changes are observed in the vicinities of the operating conductors. By using for the cholesteric-phase liquid-crystal material a mixture of at least first and second ingredients, with the first and second ingredients spanning respectively different portions of the temperature range from about 20° C. to about 32° C., desirable and useful indications are rapidly obtained without the use of particular testing-environment conditions or particular glass-storage conditions.

3,590,372
SPREADING RESISTANCE METHOD AND APPARATUS FOR DETERMINING THE RESISTIVITY OF A MATERIAL

Dominic P. DeSantis, Millbrook; Ralph G. Dessauer, Poughkeepsie; Edward F. Gorey, Beacon; Michael R. Poponiak, Newburgh; Christian P. Schneider, Wappinger Falls, and Paul A. Schumann, Jr., Wappingers Falls, all of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1968, Ser. No. 786,962
Int. Cl. G01r 27/14
U.S. Cl. 324—64 35 Claims



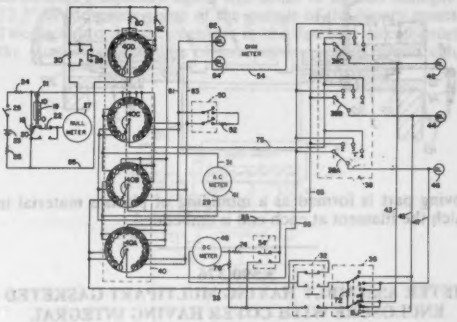
A three-point probe is employed to determine the spreading resistance of a material with the spreading resistance probe, which is common to both the current source and a voltage measuring means, being moved into engagement with the material after the other two probes are in engagement with the material. The velocity with which each of the probes engages the material is controlled and is variable. To ascertain that a good contact has been made by the spreading resistance probe and the magnitude of the current flowing through the material from the current source, the voltage measuring means is connected across resistance means in the wire from the current source to the spreading resistance probe and current is directed through the resistance means in opposite directions by flowing through the material between the spreading resistance probe and one of the other two probes. After the magnitude of the current has been determined, the voltage measuring means is connected to the spreading resistance probe adjacent its contact to the material and to the other of the two probes, which is not connected to the current source, to determine the voltage drop through the material due to current from the current source flowing in opposite directions through the material. The amount of difference between the two voltage readings on the specimen indicates if good contact is achieved.

3,590,373
STRAY VOLTAGE AND CONTINUITY TEST DEVICE

John E. Lake, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Army

Filed June 16, 1969, Ser. No. 833,277
Int. Cl. G01r 15/12
U.S. Cl. 324—73 R 2 Claims

A test device adapted for measuring AC voltage, DC voltage, and resistance in missile circuits without changing the interconnection between the missile circuits and the test device. The test device has a three pole reverse polarity switch in which the three poles have input terminals adapted for connection to the missile circuits to be measured. The reverse polarity switch has four throw contacts related with each pole where the four throw contacts are connected back to three poles of a four pole master select switch. The fourth pole of the master select switch is connected to the negative side of a current source in one leg of a limited current flow resistor bridge circuit, with the positive side of the current source connected to various fixed contacts related with the master select switch that are used in making resistance measurements. Each of the four poles of the master select switch has a wiper arm and 17 related fixed contacts for switching

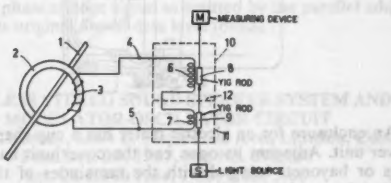


metering instrument connections through the reverse polarity switch and to circuits within a missile for measuring voltage and resistance therein.

3,590,374
CURRENT MEASURING APPARATUS UTILIZING COMBINED ROTATIONAL EFFECTS OF TWO OR MORE FARADAY ELEMENTS

Brian Arthur Evans, Redhill, Surrey; Ronald Ferguson Pearson, Reigate, Surrey, and Frederick William Harrison, Reigate, Surrey, all of, England, assignors to U.S. Philips Corporation

Filed Jan. 27, 1969, Ser. No. 794,102
Claims priority, application Great Britain, Jan. 26, 1968, 4232/68
Int. Cl. G01r 19/08
U.S. Cl. 324—96 19 Claims



Apparatus for measuring the current in a high voltage line includes a magnetic core encircling the line. A coil is wound on the core to derive a current that is proportional to the line current. A pair of energizing coils each having a different number of turns are connected to the first coil. A pair of aligned magneto-optic Faraday elements are magnetically coupled to individual ones of the energizing coils. A beam of plane polarized infrared energy is directed through the Faraday elements to a detector. The detector indicates the total Faraday rotation produced by the Faraday elements on the infrared energy, which in turn is a function of the current in the line.

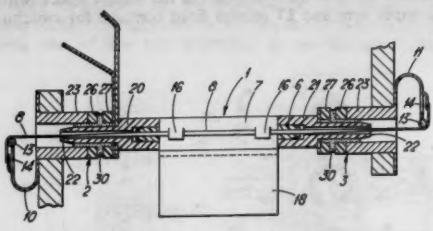
3,590,375
ELECTRICAL MEASURING INSTRUMENTS

Frederick A. Sills, London, England, assignor to Crompton Parkinson Limited, Aldwych, London, England

Filed Apr. 7, 1969, Ser. No. 813,852
Claims priority, application Great Britain, Apr. 11, 1968, 17,542/68
Int. Cl. G01r 1/00
U.S. Cl. 342—154 R 4 Claims

An electrical measuring instrument of the kind in which the rotary moving part is supported at each end by an axially

extending tensioned filament and in which the body of the moving part is formed as a moulding of plastics material in which the filament at each end is embedded.

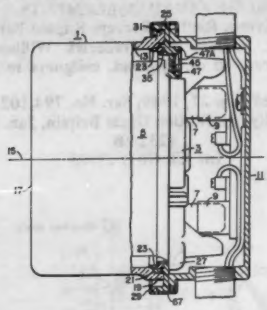


3,590,376

METER ASSEMBLY HAVING MULTIPART GASKETED ENCLOSURE WITH COVER HAVING INTEGRAL FASTENING LUGS

Frederick E. Mindt, Raleigh; William J. Zisa, Cary; Walter G. Azelkas, Raleigh, and Eugene C. Knecht, Raleigh, all of, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 2, 1968, Ser. No. 718,073
Int. Cl. G01r *1/04*; B65d *41/06*
U.S. Cl. 324—156 **2 Claims**



An enclosure for an electric meter has a cup-shaped glass cover unit. Adjacent its open end the cover unit has spaced lugs or bayonets integral with the remainder of the cover unit. A base unit is molded from a phenolic resin material for the purpose of releasably closing the open end of the cup-shaped cover unit. The base unit has a rim which surrounds the open end of the cover unit and has clamps or flanges which cooperate with the lugs for the purpose of urging the cover unit towards the base unit in response to relative rotation therebetween.

A thin-wall elastomer gasket is provided with a conical configuration. The larger diameter end of the gasket is snugly received within a circular groove provided in the base unit. A conical guide surface formed on the interior surface of the cover unit guides the remaining end of the gasket into proper sealing engagement with the cover unit. Contact blades may pass through the base unit for detachable reception in contact jaws of a conventional meter socket.

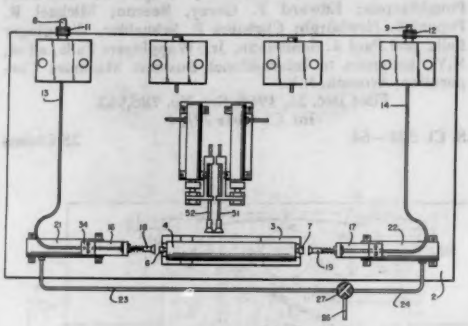
3,590,377

TEST FIXTURE EMPLOYING AUTOMATIC QUICK CONNECT-DISCONNECT ASSEMBLY FOR MICROWAVE COAXIAL CONNECTIONS

Gunther U. Sorger, Bethesda, Md., assignor to Weinschel Engineering Co., Inc., Gaithersburg, Md.

Filed July 30, 1968, Ser. No. 748,770
Int. Cl. G01r *31/00*; H01r *13/20*
U.S. Cl. 324—158 **3 Claims**

A test fixture for microwave units featuring a contact assembly for rapidly and simultaneously engaging a plurality of coaxial connectors of a unit to be production-tested, the assembly having funnel-shaped guides for accurately centering the test circuit contacts with those under test, and pneumatic or other power drive means for firmly engaging the contacts without the necessity for manually tightening down coupling nuts or bayonet fasteners.

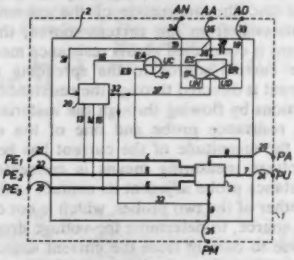


3,590,378

FAULT-DETECTING MONITOR FOR INTEGRATED CIRCUIT UNITS

Georges Kassabgi, Pregnana Milanese, Milan, Italy, assignor to General Electric Information Systems S.P.A., Caluso, Turin, Italy

Filed Nov. 14, 1968, Ser. No. 775,790
Claims priority, application Italy, Nov. 16, 1967, 22,747 A/67
Int. Cl. G01r *31/22*, *31/30*
U.S. Cl. 324—158 **5 Claims**



A substrate supporting an operational integrated circuit and further supporting a fault-detecting monitor integrated circuit, wherein the monitor circuit samples a plurality of check points in the operational circuit to sense faulty functioning of the operational circuit, enters into a storage member an indicium of the fault status of the operational circuit, and delivers at output terminals of the substrate signals representing the indicium stored in the storage member.

3,590,379

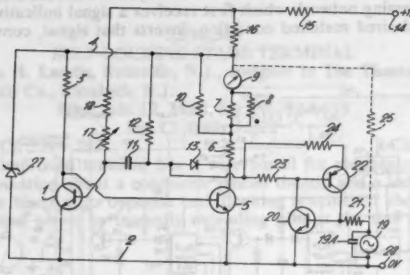
MONOSTABLE MULTIVIBRATOR PULSE FREQUENCY METERS

Bernard F. Fellerman, 8, Avon Court,25, Holden Road, Woodside Park, London, N.12, and Henry S. Marro, 29, Highfield Avenue, Kingsbury, London, N.W. 9, both of, England

Filed July 14, 1969, Ser. No. 841,454
Claims priority, application Great Britain, July 19, 1968, 34625/68
Int. Cl. G01p *3/48*
U.S. Cl. 324—169 **10 Claims**

A vehicle instrument for providing an indication of engine or vehicle speed includes an indicating meter supplied from a

monostable circuit. The monostable circuit is triggered by input pulses derived in dependence upon engine or vehicle speed. The monostable circuit includes two transistors forming the active components thereof, and the input pulses are



applied to a side of a capacitor in the monostable circuit connected to the normally nonconducting one of said transistors. The monostable circuit is arranged to supply pulses of predetermined width and height product to the meter irrespective of the rate of occurrence of the input pulses.

3,590,380

REPEATER STATION FOR INFORMATION SIGNALS CONTAINING PSEUDO-RANDOM AUXILIARY SIGNALS

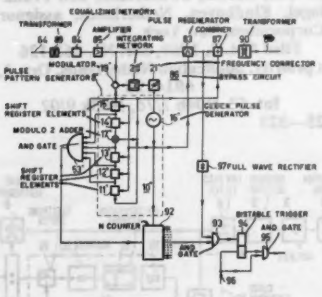
Leo Eduard Zegers; Wilfred Andre Maria Snijders, and Jan Kuilman, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1969, Ser. No. 800,428

Claims priority, application Netherlands, Feb. 23, 1968, 6802652

Int. Cl. H03k *11/00;, 13/32*

U.S. Cl. 325—13 **6 Claims**



A repeater station for a composite pulse information signal and a pseudo-random auxiliary signal has a local pseudo-random generator synchronized with the received auxiliary signal. The output of the local generator is combined with the proper amplitude with the output of a pulse regenerator to yield a regenerated output signal.

3,590,381

DIGITAL DIFFERENTIAL ANGLE DEMODULATOR

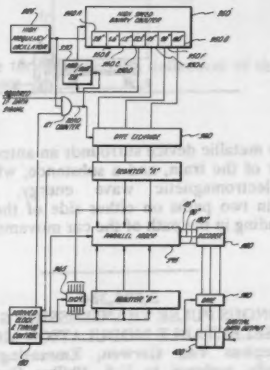
Robert G. Ragsdale, Hollywood, Fla., assignor to International Communications Corporation, Miami, Fla.

Filed Mar. 17, 1969, Ser. No. 807,671

Int. Cl. H03k *9/06*

U.S. Cl. 325—30 **21 Claims**

A digital differential angle demodulator for use in a high bit rate digital data transmission system utilizing randomly selected voice grade telephone lines is disclosed. The demodulator derives a clock signal from an information-representing phase shifted intermediate frequency modulated signal. This clock signal is employed to synchronously gate a high frequency counter output into a detector circuit which samples a precise portion of an intermediate frequency signal containing the phase shift information to be ascertained. The high speed counter is phase locked to the intermediate frequency carrier so that the zero crossing of the squared intermediate frequency signal will occur at an odd multiple of 22.5° in the phase value of the output of the binary counter. Two separate storage registers in the detector circuit receive the most significant bits of successive counter output values



depending upon the phase sampled from the precise portion of the information-containing signal. A parallel adder determines the difference between successive counts, each count of which is characteristic of the information-representing phase change originally received during the interval in question. Phase locking of the high speed counter assures that random phase changes caused by system noise will not adversely affect the detection operation. An encoder converts the phase change signal as emitted by the parallel adder back to its original digital data level format.

3,590,382

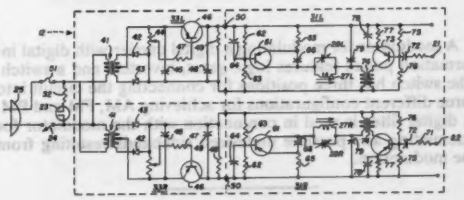
WIRELESS STEREO SOUND SPEAKER SYSTEM AND MODULATOR-OSCILLATOR CIRCUIT

Frank M. Kenney, 2584 E. Maplewood Ave., Littleton, Colo.

Filed Dec. 20, 1967, Ser. No. 692,140

Int. Cl. H04b *1/04, 1/20;* **H03c** *3/00*

U.S. Cl. 325—36 **8 Claims**

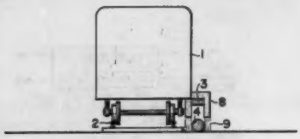


Portable wireless stereo sound transmitter and system including one transmitter adapted for connection to one sound source for transmitting sound by wave energy at one high frequency channel to first remote receiving station and another transmitter adapted for connection to another sound source for simultaneously transmitting sound from another sound source by wave energy at another high frequency to second remote receiving station. The novel FM modulator-oscillator includes the series connection of a transformer, an L–C tank circuit, and a capacitor with the collector and emitter electrodes of a transistor connected thereto.

3,590,383
TRAIN COMMUNICATIONS SYSTEM INVOLVING FLUID SIGNAL SHIELDING MEANS

Tsuneo Nakahara, Nishinomiya-shi, and Hiroshi Kitani, Sumiyoshi-ku, both of, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Oct. 15, 1968, Ser. No. 767,770
Claims priority, application Japan, Oct. 16, 1967, 42/66421
Int. Cl. H04b *1/10*; H01q *1/32*
U.S. Cl. 325—52 **7 Claims**

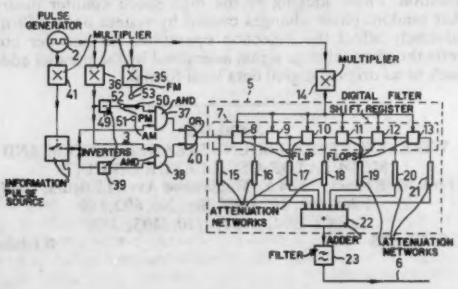


A hollow metallic device surrounds an antenna fixed to the moving car of the train, and a substance, which absorbs or reflects electromagnetic wave energy, is discharged therefrom in two paths on either side of the leakage wave guide extending in the path of the car movement adjacent the track.

3,590,384
SYNCHRONOUS PULSE TRANSMISSION SYSTEM WITH SELECTABLE MODULATION MODE

Petrus Josephus Van Gerwen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 24, 1968, Ser. No. 762,023
Claims priority, application Netherlands, Oct. 7, 1967, 6713667
Int. Cl. H04b *1/04*
U.S. Cl. 325—141 **4 Claims**



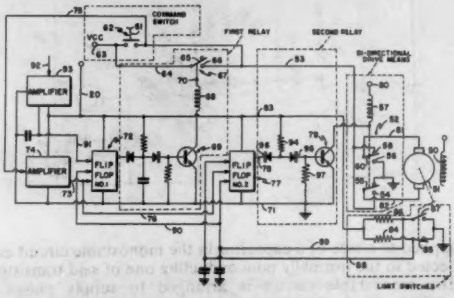
A modulator for modulating a digital carrier with digital information pulses features logic gates, inverters and a switch. The switch has three positions for connecting the circuit into three different configurations for achieving AM, FM and PM. A digital filter is used in conjunction with the modulator for attenuating any possible undesired sidebands resulting from the modulation.

3,590,385
SEMI-AUTOMATIC TUNING CIRCUIT FOR AN ANTENNA COUPLER

James R. Sabo, Loveland, and John H. Keuper, Westchester, both of, Ohio, assignors to Avco Corporation, Cincinnati, Ohio

Filed July 25, 1969, Ser. No. 844,982
Int. Cl. H04b *1/04*
U.S. Cl. 325—174 **3 Claims**

In response to a manual "tune" order, this system drives the inductance in an antenna matching network to the maximum inductance position, whereupon the drive is reversed and control of the adjustment of the inductor is assumed by the processed output of a mismatch sensing device. The system comprises a first binary device which determines whether or not power will be rendered available to energize the driving circuits for the inductance, together with a second binary device which determines the direction in which the inductance is driven. The system includes a signal processing network which first receives a signal indicative of the desired matched condition, inverts that signal, converts

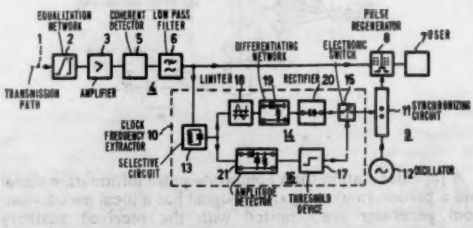


the resultant into a staircase signal, inverts and shapes the staircase signal into one having a smooth slope, and finally, through the use of an operational amplifier, converts the indication of zero-slope attainment into a pronounced negative-going signal or "tuned" indication which is utilized to control the binary devices in such a way that the toward minimum drive on the inductance is arrested substantially at the point of attainment of the desired match.

3,590,386
RECEIVER FOR THE RECEPTION OF INFORMATION PULSE SIGNALS LOCATED IN A PRESCRIBED TRANSMISSION BAND

Felix Daniel Tisi, Zurich, Switzerland, and Frank De Jager, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,126
Claims priority, application Netherlands, Oct. 2, 1968, 6814125
Int. Cl. H04b *1/16*; H03k *9/02*
U.S. Cl. 325—321 **5 Claims**



A receiver for the reception of synchronous information pulse signals provided with a detection device from which a multilevel information pulse signal can be derived, and a local clock pulse generator, and a clock frequency extractor for recovering the clock frequency for synchronizing the local clock pulse generator.

In order to recover the clock frequency in its proper phase from the received information pulse signals themselves, a multilevel information pulse signal derived from the detection device is applied according to the invention to a frequency selective circuit included in the clock frequency extractor which circuit is tuned to half the clock frequency and whose output is connected to a nonlinear circuit acting as a frequency doubler which is connected through a normally open electronic switch to the phase-synchronizing circuit of the local clock pulse generator, the electronic switch

being controlled by a control circuit including a threshold device to which a signal derived from the frequency selective circuit a applied to produce a control signal for closing the electronic switch when said derived signal exceeds the threshold value of said threshold device.

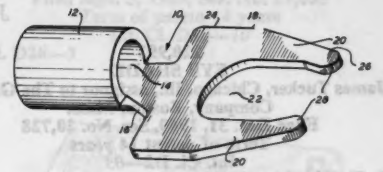
3,590,387

SELF-LOCKING SPADE TERMINAL

Earle H. Landis, Belleville, N.J., assignor to The Thomas & Betts Co., Elizabeth, N.J.

Filed Feb. 12, 1968, Ser. No. 704,616
Int. Cl. H01r *11/22*
U.S. Cl. 339—257 **2 Claims**

The improved terminal has a wire barrel for mechanical deformation about a conductor placed therein and a locking spade blade at its opposite end. Locking is achieved about a terminal screw by inwardly extending nibs at the tine ends which restrict the blade slot and by the thickness of the tines which permits nesting within the thread of such screw. The

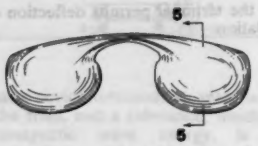


resiliency of the terminal permits deflection of the tine nibs during installation.

DESIGNS

JUNE 29, 1971

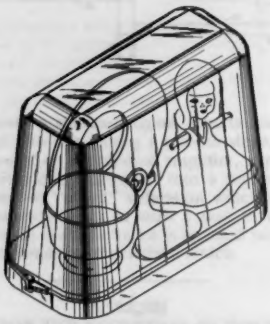
220,993
EYE SHADE
James Tucker, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 31, 1969, Ser. No. 20,728
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234



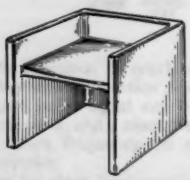
220,994
COMBINED BOTTLE AND DISPLAY CONTAINER THEREFOR
Jay Doblin, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.
Filed Oct. 13, 1969, Ser. No. 19,545
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12

220,995
JAR
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Nov. 3, 1969, Ser. No. 19,912
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100

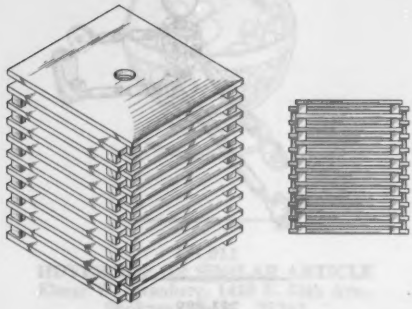
220,996
COMBINED TOY DOLL AND TEA SET DISPLAY PACKAGE
Richard W. Irons, Torrance, Frank A. Mediate, Pasadena, and Thomas E. See, Huntington Beach, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 9, 1970, Ser. No. 21,342
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—193



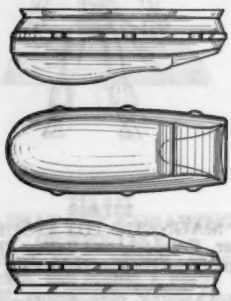
220,997
CONVERTIBLE CHAIR
John Svezia, Milburn, N.J., Denison C. Stockman, Brooklyn, N.Y., John A. Gale, Wayzata, Minn., and William Kenneth Menke, Glendale, Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed June 4, 1969, Ser. No. 17,507
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—1



220,998
FORMATION MODEL FOR RADIOACTIVE BOREHOLE LOGGING TOOLS
Dale H. Reed, William C. Pritchett, Robert D. Coffee, Jack E. Hardison, and Carl A. Youngman, Dallas, Tex., assignors to Atlantic Richfield Company, Philadelphia, Pa.
Filed Mar. 1, 1968, Ser. No. 10,803
Term of patent 14 years
Int. Cl. D10—*11*
U.S. Cl. D16—2



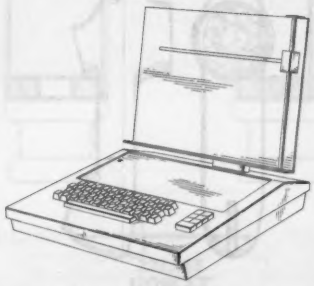
220,999
COFFIN
Raymond Poulin, 111 Notre Dame St. N., Thetford Mines, Quebec, Canada
Filed Aug. 21, 1969, Ser. No. 18,781
Term of patent 3½ years
Int. Cl. D31
U.S. Cl. D19—1



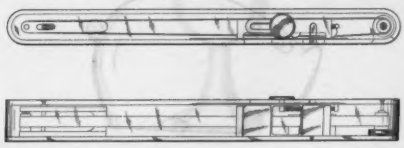
221,000
DIMENSIONALLY STABLE ANODE
James Wesley Bess, Sr., Painesville, Ohio, Oronzio de Nora, Milan, Italy, Richard E. Loftfield, Chardon, Ohio, and Giovanni Trisoglio, Milan, Italy, assignors to Electronor Corporation, Chiasso, Switzerland
Filed Aug. 8, 1969, Ser. No. 18,599
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1

221,001
ELECTRIC SOLDERING EQUIPMENT ANALYZER
Joseph A. Sylvester, Wayne, N.J., assignor to Hexacon Electric Company
Filed Sept. 5, 1969, Ser. No. 19,035
Term of patent 14 years
Int. Cl. D10—*10*
U.S. Cl. D26—1

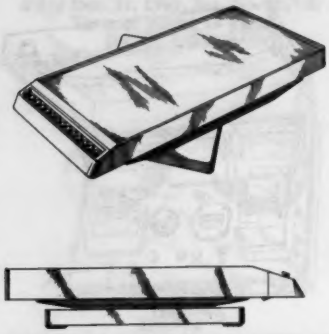
221,002
COMPUTER KEYBOARD TERMINAL
Joseph R. Bachman II, Manotick, Ontario, Canada, assignor to Consolidated Computer Services Limited, Toronto, Ontario, Canada
Filed Apr. 3, 1970, Ser. No. 22,239
Claims priority, application Canada Feb. 5, 1970
Term of patent 3½ years
Int. Cl. D14—*02*
U.S. Cl. D26—5



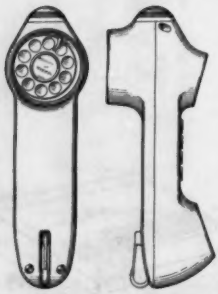
221,003
ENDLESS MAGNETIC-TAPE CARTRIDGE
William David Cohen, Huntington, N.Y., assignor to Systems Resources Corporation, Plainview, N.Y.
Filed Sept. 30, 1969, Ser. No. 19,352
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



221,004
COMBINED SWIVEL BASE AND INDEX FOR DESK TELEPHONES
Lyle H. Van Dyke, P.O. Box 14841 Portland, Oreg. 97214
Filed Feb. 11, 1970, Ser. No. 21,374
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



221,005
HAND TEST TELEPHONE
Jim C. Garrett and Robert H. Johnson, both of 3300 E. Spring St., Long Beach, Calif. 90806
Filed Aug. 17, 1970, Ser. No. 24,524
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



221,006
SAVINGS BANK
Kaarle H. E. Tavela, Helsinki, Finland, assignor to Oy MK-Tuote AB, Helsinki, Finland
Filed Nov. 6, 1969, Ser. No. 19,965
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—2

221,007
FIGURE TOY
Marius J. Morin, Torrance, Henry J. Folson, Redondo Beach, J. Stephen Lewis, Pacific Palisades, and Emil H. von Winckelmann, Van Nuys, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 2, 1970, Ser. No. 21,209
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—4

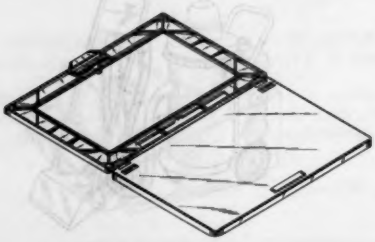
221,008
FIGURE TOY OR THE LIKE
Richard W. Irons, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 2, 1970, Ser. No. 21,212
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—4

221,009
MAGNETIC TOY FIGURE
George Lerner, Freeport, and Julius Ellman, Brooklyn, N.Y., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed May 15, 1970, Ser. No. 23,004
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—4

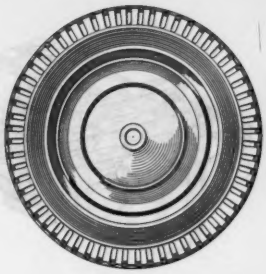
221,010
SAVINGS BANK
Kaarle H. E. Tavela, Helsinki, Finland, assignor to Oy MK-Tuote AB, Helsinki, Finland
Filed Nov. 6, 1969, Ser. No. 19,964
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—11

221,011
HOVER TOP OR SIMILAR ARTICLE
Elmer W. Swanberg, 1420 E. 58th Ave., Spokane, Wash. 99203
Filed Feb. 10, 1969, Ser. No. 15,714
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

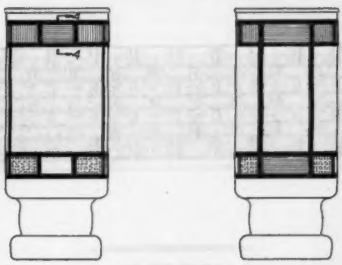
221,012
HINGED TRAY FOR A DRAWING TOY OR THE LIKE
Andrew M. Holland, Santa Monica, Joseph P. Morris, Huntington Beach, and Martin I. Sheps, Palos Verdes Peninsula, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 2, 1970, Ser. No. 21,202
Term of patent 14 years
Int. Cl. D21—*99*
U.S. Cl. D34—15



221,013
TOY VEHICLE WHEEL
Harry Golden, New York, N.Y., assignor to Ideas for Auto and Bike Specialties, Inc., New York, N.Y.
Filed Mar. 9, 1970, Ser. No. 21,779
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

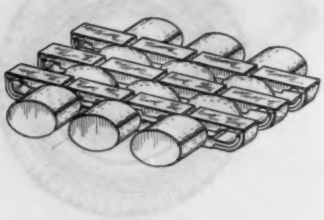


221,014
TUMBLER OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Glass Corporation, Lancaster, Ohio
Filed Nov. 14, 1968, Ser. No. 14,466
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8



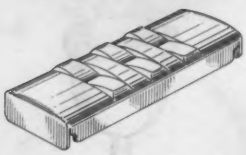
221,015
GOBLET
Francis B. Northup, 725 West End Blvd., Winston-Salem, N.C. 27101
Filed Apr. 28, 1970, Ser. No. 22,691
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8

221,016
LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Yuen Sang Poon, 36 Kam Wah St., Hong Kong
Filed Jan. 29, 1970, Ser. No. 21,140
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4

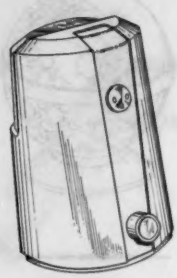


221,017
LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Yuen Sang Poon, 36 Kam Wah St., Hong Kong
Filed Jan. 29, 1970, Ser. No. 21,141
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4

221,018
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Francis E. Williams, Greenville, R.I.
(Speidel Division, 70 Ship St., Providence, R.I. 02903)
Filed July 16, 1970, Ser. No. 23,975
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4



221,019
DENTAL ILLUMINATOR
Donald E. Everburg, Southbridge, and Richard R. Maiese, Webster, Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Dec. 19, 1969, Ser. No. 20,576
Term of patent 7 years
Int. Cl. D26—*02*
U.S. Cl. D48—20

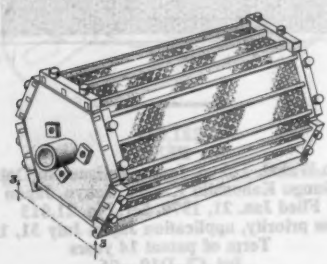


221,020
CIGARETTE LIGHTER
Alfred H. Mann, 741 George St., Norristown, Pa. 19401
Filed Mar. 13, 1970, Ser. No. 21,894
Term of patent 7 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

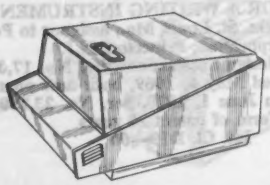
221,021
CARPET CLEANER
Judson O. Jones, 17 Inglewood Drive, Greenville, S.C. 29609
Filed Feb. 6, 1970, Ser. No. 21,314
Term of Patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D49—11

221,022
TOOL FOR CLEANING GROOVES IN PISTON RINGS
Ragnar Gundersen, 3847 Brunkeberg, Norway
Filed Jan. 2, 1970, Ser. No. 20,740
Claims priority, application Norway Sept. 23, 1969
Term of patent 3½ years
Int. Cl. D7—*06*
U.S. Cl. D49—23

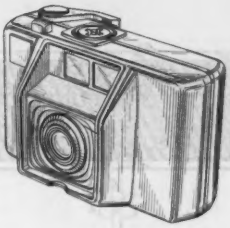
221,023
PLATING BARREL
Cyrus I. Knecht, Jr., Red Bank, N.J., assignor to Daniels Plating Barrel & Supply Company, Linden, N.J.
Filed Jan. 2, 1970, Ser. No. 20,742
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1



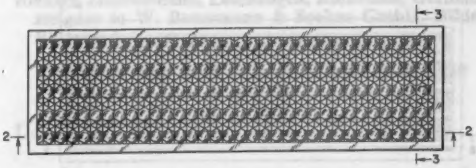
221,024
CABINET FOR A FILM PROCESSING MACHINE
Conrad E. Lee, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.
Filed Aug. 22, 1969, Ser. No. 18,827
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D61—1



221,025
CAMERA
Masahiro Fukuda, Tokyo, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Kanagawa-ken, Japan
Filed June 5, 1970, Ser. No. 23,329
Claims priority, application Japan Dec. 11, 1969
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1

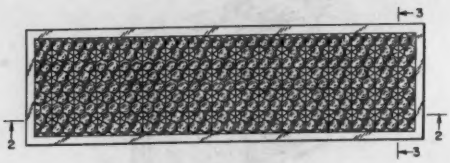


221,026
COMBINED REFLECTOR AND LENS
Sidney A. Heenan, Park Ridge, and Eugene A. Peterson, Northbrook, Ill., assignors to Amerace Esne Corporation, Union, N.J.
Filed Dec. 29, 1969, Ser. No. 20,688
Term of patent 14 years
Int. Cl. D29—*99*; D12—*99*; D26—*06*
U.S. Cl. D72—1

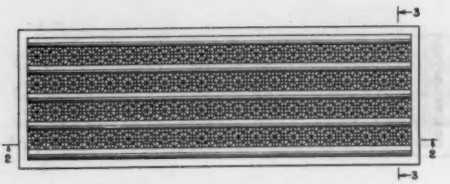


221,027
DRIVEWAY MARKER
Anthony J. Montalbano, Des Plaines, Ill., assignor to Amerace Esna Corporation, Union, N.J.
Filed Jan. 6, 1970, Ser. No. 20,785
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1

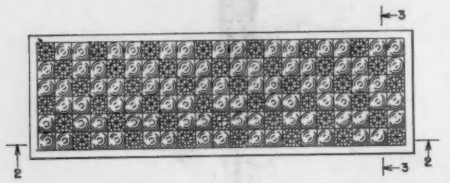
221,028
COMBINED REFLECTOR AND LENS
Sidney A. Heenan, Park Ridge, and Eugene A. Peterson, Northbrook, Ill., assignors to Amerace Esna Corporation, Union, N.J.
Filed Jan. 23, 1970, Ser. No. 21,042
Term of patent 14 years
Int. Cl. D29—*99;* D12—*99;* D26—*06*
U.S. Cl. D72—1



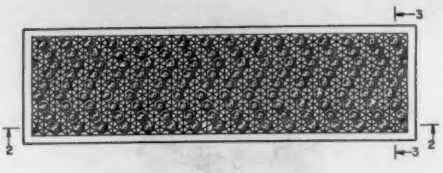
221,029
COMBINED REFLECTOR AND LENS
Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Esna Corporation, Union, N.J.
Filed Feb. 6, 1970, Ser. No. 21,320
Term of patent 14 years
Int. Cl. D29—*99;* D12—*99;* D26—*06*
U.S. Cl. D72—1



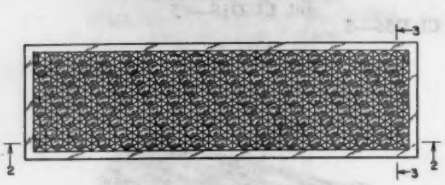
221,030
COMBINED REFLECTOR AND LENS
Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Esna Corporation, Union, N.J.
Filed Mar. 3, 1970, Ser. No. 21,713
Term of patent 14 years
Int. Cl. D29—*99;* D12—*99;* D26—*06*
U.S. Cl. D72—1



221,031
COMBINED REFLECTOR AND LENS
Sidney A. Heenan, Park Ridge, and Eugene A. Peterson, Northbrook, Ill., assignors to Amerace Esna Corporation, Union, N.J.
Filed Apr. 6, 1970, Ser. No. 22,252
Term of patent 14 years
Int. Cl. D29—*99;* D12—*99;* D26—*06*
U.S. Cl. D72—1



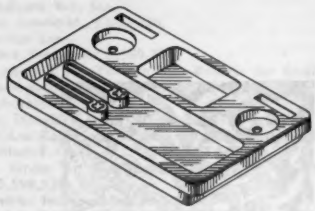
221,032
COMBINED REFLECTOR AND LENS
Sidney A. Heenan, Park Ridge, and Eugene A. Peterson, Northbrook, Ill., assignors to Amerace Esna Corporation, Union, N.J.
Filed Apr. 6, 1970, Ser. No. 22,254
Term of patent 14 years
Int. Cl. D29—*99;* D12—*99;* D26—*06*
U.S. Cl. D72—1



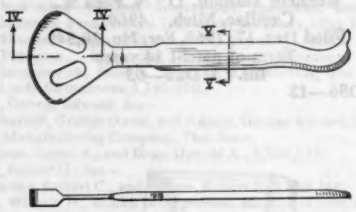
221,033
PEN
Noboro Wakai, Tokyo, Japan, assignor to Dainihon Bungu Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 21, 1970, Ser. No. 21,013
Claims priority, application Japan July 31, 1969
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

221,034
CASING FOR A WRITING INSTRUMENT
Harold E. Koeln, St. Louis, Mo., assignor to Penn Corporation, Princeton, N.J.
Continuation of design applications Ser. No. 17,025 and 17,027, both filed May 6, 1969, both now abandoned. This application June 1, 1970, Ser. No. 23,250
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

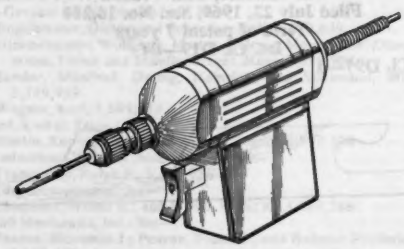
221,035
TRAY FOR MEDICAL EQUIPMENT
Kenneth Raines, Bethlehem, Pa., assignor to Burron Medical Products, Inc., Bethlehem, Pa.
Filed Apr. 29, 1970, Ser. No. 22,696
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



221,036
TONGUE SCRAPER
N. Dasan Potti, 94 Debra, Buffalo, N.Y. 14207
Filed Dec. 23, 1969, Ser. No. 20,621
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—12

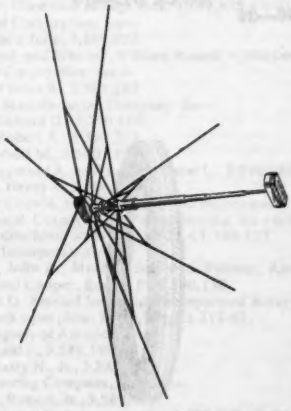


221,037
MINIATURE POWER ACTUATED SINGLE PUNCH FOR IMPLANTING HAIR
Frank A. Bellantoni, 101 Helena Ave., Yonkers, N.Y. 10710
Filed Apr. 6, 1970, Ser. No. 22,248
Term of patent 14 years
Int. Cl. D24—*03*; D8—*02*
U.S. Cl. D83—12

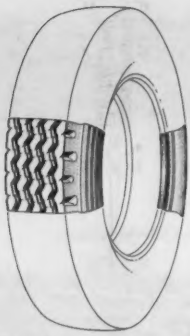


221,038
COMBINED BRUSH AND COMB
James Tucker, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.
Filed Sept. 10, 1969, Ser. No. 19,089
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8

221,039
UMBRELLA FRAME
Richard Zimmermann, Leichlingen, Rhineland, Germany, assignor to W. Bauermann & Soehne GmbH, Hilden, Rhineland, Germany
Filed Mar. 3, 1970, Ser. No. 21,723
Claims priority, application Germany Sept. 4, 1969
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3

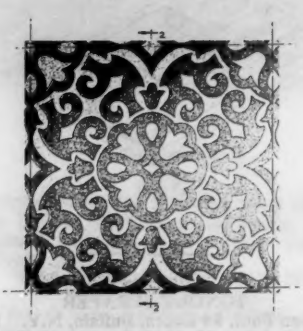


221,040
TIRE
Arthur S. Ravenhall, Solihull, England, assignor to Dunlop Holdings Limited, Birmingham, England
Filed Nov. 17, 1969, Ser. No. 20,149
Claims priority, application Great Britain July 1, 1969
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20

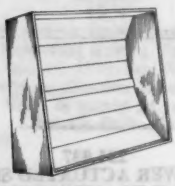


221,041
TIRE
Claude A. Hart, Orchard Hills, England, assignor to Dunlop Holdings Limited, Birmingham, England
Filed Dec. 31, 1969, Ser. No. 20,720
Claims priority, application Great Britain July 15, 1969
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20

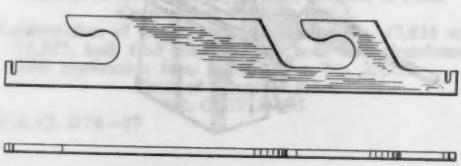
221,042
HARD SURFACE FLOOR COVERING OR SIMILAR ARTICLE
Robert N. Byerly, Greenwood Lake, N.Y., and Harry A. Shortway, Glen Rock, N.J., assignors to Congoleum Industries, Inc., Kearney, N.J.
Filed Mar. 14, 1969, Ser. No. 16,238
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—17



221,043
MESSAGE DISPLAY UNIT
Kenneth Taishoff, 117 N. Park St., Cadillac, Mich. 49601
Filed Dec. 17, 1969, Ser. No. 20,549
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12



221,044
HANGER FOR MARGINAL PERFORATED FORMS
Donald A. Douglas, 8315 Briargate Drive, San Antonio, Tex. 78230
Filed July 22, 1969, Ser. No. 18,289
Term of patent 7 years
Int. Cl. D19—*04*
U.S. Cl. D97—1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JUNE, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Randolph, Robert W.; Thornton, Duane V.; and Yeates, Richard P., 3,589,754.
Thornton, Duane V., 3,589,305.

Achener, Claude, to Quartz & Silice, S.A. Devitrification of the core of a coaxial glass fiber. 3,589,878, Cl. 65-3.

Aciers et Outillage Peugeot: *See—*
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Ackerman, Thomas G., to Bethlehem Steel Corporation. Guard rail assembly. 3,589,681, Cl. 256-13.1

Acks, Eugene A., to Addressograph-Multigraph Corporation. Device for feeding curled sheet material. 3,589,286, Cl. 101-228.

Acme Fishing Tool Company: *See—*
McKain, Walter P., 3,589,456.

Adamov, Ary Artemievich: *See—*
Freidlin, Gilya Naumovich; Tjurin, Jury Mikhailovich; Kovsman, Evgeny Pavlovich; Adamov, Ary Artemievich; Kochergin, Nikolai Alexandrovich; Lubyanitsky, Izrail Yakovievich; Nalivaiko, Alexandr Semenovich; Posternak, Svetlana Mikhailovna; Ferd, Maxim Leibovich; Kofanova, Olga Tikhonovna; Shtefan, Sergei Mikhailovich; Kovalev, Alexei Danilovich; Timagina, Margarita Sergeevna; Buerakov, Alexandr Stepanovich; Fioshin, Makhail Yakovlevich; and Kazakova, Ljudmila Ivanovna,3,589,990.

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Adams Manufacturing Company, The: *See—*
Morse, James A.; and Dray, Donald A., 3,589,845.

Adams, Robert G.: *See—*
Warren, Robert C.; and Adams, Robert G.,3,589,346.

Adams, William D., to ESB Incorporated. Method of constructing battery intercell connectors through the partition. 3,589,948, Cl. 136-134.

Adamson, Arthur P., to General Electric Company. Exhaust gas flow diverting apparatus for a jet engine. 3,589,617, Cl. 239-265.31

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Acks, Eugene A., 3,589,286.
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Schulze, John J., 3,589,713.

Adler, Irwin L.; and Feldbrugge, Alonzo H., to General Foods Corporation. Method of roasting coffee. 3,589,912, Cl. 99-68.

Aerojet-General Corporation: *See—*
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Aeroquip Corporation: *See—*
Basinger, Charles B., 3,590,201.
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Agamian, Alexander. Exercise apparatus with movable hand and foot platforms. 3,589,720, Cl. 272-80.

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Air-Con, Incorporated: *See—*
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Pearne, Florentin J.; Pearne, Frank S.; and Robson, Frederick G., 3,589,495.

Airdo, Joseph, to Bishop Freeman Company. Steam and vacuum controller for the buck of a garment press. 3,589,042, Cl. 38-16.

Akopov, Ernest Mikhailovich. Surgical instrument for stitching tissues by means of staples. 3,589,589, Cl. 227-153.

Aktiebolaget Kamyr: *See—*
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Albrinck, Donald Joseph; and Guertin, Alfred Thomas, to Formica Corporation. Decorative laminate surfaced with a compressed layer of a fibrillated acrylic fiber paper, said paper having been transparentized during a heat and pressure consolidation step and having been substantially free of any impregnating resin. 3,589,974, Cl. 161-150.

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Alexander, Charles M. Bicycle supporting stand for exercising. 3,589,717, Cl. 272-73.

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Algemene Kunstzijde Unie, N.V.: *See—*
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Aluminum Company of America: *See—*
Levin, Donald J., 3,589,199.
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American Hoist & Derrick Company: *See—*
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Anderson, James H. Vehicular air-conditioning and heating system. 3,589,436, Cl. 165-23.
Anderson, Robert G.; Donald, William M.; and Drag, Tony J., to Canadian Westinghouse Company, Limited. Panelboard with insulative circuit breaker supports mounted on the bus bars. 3,590,332, Cl. 317-119.
Anderson, Robert J., to Harris-Intertype Corporation. Cylinder with yieldable periphery. 3,589,285, Cl. 101-216.
Anderson, Rodney H.; and Logsdon, John S., to Caterpillar Tractor Company. Earthmoving scraper with tandem bowls. 3,589,041, Cl. 37-129.
Andreev, Stanislav Fedorovich: *See—*
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Andrews, Francis W.; and Sussman, Philip S., to Mark-Tex Corporation. Cartridge marker construction. 3,589,824, Cl. 401-206.
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Andrews, William Page; and Brandt, Yale M., to Reynolds Metals Company. Composite sheet of plastic and metallic material and method of making the same. 3,589,975, Cl. 161-165.
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Aoki, Tomizo; and Nishida, Nagayoshi. Method of and container for treating tobacco to reduce alkaloid and for content thereof. 3,589,374, Cl. 131-121.
Aono, Shunji: *See—*
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Appleby, Geraldine McGeer. Shelf conveyor apparatus. 3,589,785, Cl. 312-268.
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Arbor Acres Farm, Inc.: *See—*
LaRose, Rene Norman, 3,590,128.
Arcamone, Federico; Cassinelli, Giuseppe; Di Marco, Aurelio; and Gaetani, Marcello, to Societa' Farmaceutici Italia. Adriamycin derivatives. 3,590,028, Cl. 260-210.
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Arikawa, Masayasu; Kano, Motomi; Sioyama, Hitosi; and Okamoto, Toshihiko, to Kobe Steel Ltd. Solid weld backing-up flux compositions. 3,589,951, Cl. 148-24.
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Arkansas Company, Inc.: *See—*
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Armstrong, George W. Gate valve. 3,589,670, Cl. 251-58.
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Bourgeois, Jacques, to Lesieur-Cotelle. Device for the introduction of bottles of plastics material into a trimming machine or the like. 3,589,228, Cl. 83-373.

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Braus, Harry; and Woltermann, Jay R., to National Distillers and Chemical Corporation. 3,5-di-t-butyl-4-hydroxybenzylthio -2,3-dihydroxypropane and the methyl and ethyl ethers thereof. 3,590,085, Cl. 260-609.

Braxton, Henry G., Jr.; and Lajiness, Evelyn J., to Ethyl Corporation. Herbitoxic carbamate and carbanilate compositions and method using same. 3,589,889, Cl. 71-70.

Brebion, Georges; and Huriet, Bernard, to Ircha Institut National de Recherche Chimique Appliquee. Packing materials especially for biological filters. 3,589,518, Cl. 210-150.

Brero, Oreste, to S.I.L.A. Societa' Industriale Lavorazione Acciai S.r.l. Device for remotely controlling the setting of a rear-view mirror. 3,589,208, Cl. 74-491.

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Brewer, Joe E.; and Laughinghouse, Charles L., to Westinghouse Electric Corporation. Double wall p-n junction isolation for monolithic integrated circuit components. 3,590,345, Cl. 317-235.

Bridge, Laurence; Horner, Walter J.; and Thiel, Harold F., to ESB Incorporated. Deep submergence battery having gas bubble- electrolyte scrubbing vent cap. 3,589,940, Cl. 136-6.

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Brill-Edwards, Harry; and Speirs, Kenneth K. Diffusion coating of metals. 3,589,935, Cl. 117-107.2

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Brown, Morris E., to Eastman Kodak Company. Spindle construction and means for locating a cartridge with respect to a motion picture projector or the like. 3,589,636, Cl. 242-68.3

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Burchett, Stanley. Hosiery display package having transparent protective sheet. 3,589,508, Cl. 206-45.33

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Burgett, Donald K., to Goodyear Tire & Rubber Company, The. Tire testing apparatus. 3,589,182, Cl. 73-146.

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Burkhalter, Robert, Jr., to Alwin Manufacturing Company, Inc. Dispenser for paper napkins and the like. 3,589,555, Cl. 221-35.

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Cairelli, Carmen P., to Dynamics Corporation of America. Helical blade mixer with heating device. 3,589,834, Cl. 416-95.

Cake, Arthur F., to Burroughs Corporation. Coin totalizing system. 3,590,223, Cl. 235-92.

Caldwell, Robert A., to Allis-Chalmers Manufacturing Company. Arc starting device for long electrical stick-out arc welding. 3,590,213, Cl. 219-130.

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Carfora, Joseph P. Lavatory-water closet combination. 3,588,922, Cl. 4-3.

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Carmody, Philip M.; and Slemmer, William C., to Bell Telephone Laboratories, Incorporated. Regenerative switching circuits employing charge storage diodes. 3,590,283, Cl. 307-273.

Carpenter, Herbert L., Jr.; and Dubois, Robert A., to Greif Bros. Corporation, The. Vented closure. 3,589,545, Cl. 215-56.

Carr, Lawrence J.; Rosenthal, Rudolph; and Bonetti, Giovanni A., to Atlantic Richfield Company. Esterification of tertiary alcohols. 3,590,073, Cl. 260-476.

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Chen, Richard U., to Polaroid Corporation. Photographic processing apparatus. 3,589,262, Cl. 95-89.
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Classen, Alvin T., to Henningsen Foods, Inc. Egg cracking head and separating means. 3,589,419, Cl. 146-2.
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Cohn, Maurice. Method of applying fastener devices to a tape. 3,589,957, Cl. 156-66.
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Conroi, Robert. Voltage transformer with removable high voltage fuses. 3,590,320, Cl. 317-15.
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Plaat, C. Lucas; and Thrower, Arthur J., to Goodrich, B. F., Company, The. Brake retractor mechanism. 3,589,479, Cl. 188-196.

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Plakunov, James, to Eastman Kodak Company. Photographic materials containing hydrophilic colloids. 3,589,908, Cl. 96-107.

Plasser, Franz; and Theurer, Josef. Mobile track working machine. 3,589,296, Cl. 104-12.

Plasser, Franz; and Theurer, Josef. Track tamping assembly. 3,589,297, Cl. 14-12.

Plasser, Franz; and Theurer, Josef. Surface ballast tamper. 3,589,298, Cl. 104-12.

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Poliakoff, Theodore E., to American Machine & Foundry Company. Electric motor construction. 3,590,292, Cl. 310-90.

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Porter, William R. Chitin antigens and method. 3,590,126, Cl. 424-88.

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Povlacs, Lawrence J., to Akwell Industries, Incorporated. Ballon counter. 3,589,531, Cl. 214-1.

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Price, Herman H., Jr.; and Youse, George H., to Hercules Incorporated. Carpet scouring and blooming apparatus. 3,589,147, Cl. 68-5.

Price, Warren H., to Gilson Bros. Co. Attachment hitch for tractors. 3,589,450, Cl. 172-273.

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Protzmann, Donald E., to Lewis Engineering Company. Mounting for panel-type instruments. 3,589,656, Cl. 248-27.

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Pruvot, Francois C., to Regie Nationale des Usines Renault, and Automobiles Peugeot. Piston and connecting-rod assemblies of hydraulic pump or motor. 3,589,756, Cl. 287-21.

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Putman, Adrie L. Holder for sharpening hog axes. 3,589,706, Cl. 269-102.

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Rakowsky, Joseph, to Visual Effects, Inc. Method and apparatus for producing a changing pattern. 3,589,045, Cl. 40-106.54

Rakus, Joseph A.; and Sharpe, James G., to Dow Corning Corporation. Method of preparing mercaptoalkylalkoxy silanes. 3,590,065, Cl. 260-448.8

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Rankin, Thomas F. Canister holder. 3,589,870, Cl. 23-252.

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Reed, Sheridan J. Insulating jackets for instruments comprising a layer of asbestos cloth, a layer of cotton drill fabric a layer of glass fiber insulation and a layer of neoprene coated aluminized nylon. 3,589,971, Cl. 161-48.

Reedy, Albert J.; and White, Walter R., to Eastman Kodak Company. Inking properties of matte-surfaced polyester sheeting. 3,589,905, Cl. 96-87.

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Reusser, Robert E.; and Crain, Donald L., to Phillips Petroleum Company. Conversion of linear acyclic olefin to branched chain olefin. 3,590,094, Cl. 260-683.

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Rinkle, James L.; and Stapleton, Sonnie D. Convertible rack for vehicle. 3,589,576, Cl. 224-42.01

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Robb, Ian E.; and Malcolm, Marcy R., Jr., to International Telephone and Telegraph Corporation. Cable insulation piercing crimp tool, terminal and method of forming. 3,590,140, Cl. 174-84.

Robert, Andre; and Guillemet, Eliane, to Etat Francais (French State) represented by the Armies Ministerial Delegation for Armament (Center Direction of Manufactures and Navy Arms, Technical Service for Manufactures and Navy). Processes and devices for measuring stresses within a transparent body for electromagnetic waves. 3,589,812, Cl. 356-33.

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Roberts, John S., to Westinghouse Electric Corporation. Light activated semiconductor device. 3,590,338, Cl. 317-234.

Roberts, John S.; and Muss, Daniel R., to Westinghouse Electric Corporation. Light activated semiconductor controlled rectifier. 3,590,344, Cl. 317-235.

Roberts, Karl Hutcheson; and Gomolka, Marion Anthony, to Colgate-Palmolive Company. Shampoo composition. 3,590,122, Cl. 424-70.

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Robinson, John William; and Whittington, Billy Joe, to Jasper Electronic Mfg. Corporation. Preset system for electronic organs. 3,590,132, Cl. 84-1.17

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Rowe, Paul H., Sr., deceased0 (by Rowe, Paul H., Jr.; executors). Bell tone generator. 3,589,233, Cl. 84-402.

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Ruelle, Gilbert; Gillet, Roger; Tritsch, Michel; Lehuen, Christian; and Portnoi, Morduch, to Societe Generale de Constructions Electriques et Mecaniques (Alsthom). Cooling systems for amortisseur windings of dynamo electric machines. 3,590,290, Cl. 310-54.

Ruet, Jean; Serpette, Jean-Pierre; Pierre, Jacques; Lietard, Michel; and Remaud, Jacques, to Regie Nationale des Usines Renault, and Automobiles Peugeot. Flexibility corrector for vehicle suspension. 3,589,700, Cl. 267-11.

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Russell, William G., to Electrohome Limited. Electronic latching networks employing elements having positive temperature coefficients of resistance. 3,590,281, Cl. 307-272.

Russo, Michael T. Apparatus for molding plastic link chain. 3,588,959, Cl. 18-42.

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42 : 3,590,189	43 : 3,589,013	48 : 3,589,115	48 : 3,590,071	53 : 3,590,355	55 3,589,431
3,590,190	44 : 3,589,125	3,589,193	3,590,228	54 : 3,588,994	3,589,439
3,590,192	3,589,181	3,589,320	3,590,229	3,589,456	3,589,440
3,590,199	3,589,498	3,589,337	3,590,322	3,589,539	3,589,450
3,590,213	3,589,581	3,589,388	3,590,354	3,590,002	3,589,452
3,590,235	3,589,676	3,589,442	49 : 3,589,457	3,590,030	3,589,463
3,590,277	3,589,696	3,589,561	3,589,773	55 : Re.27,149	3,589,465
3,590,291	3,589,842	3,589,568	3,589,871	3,588,974	3,589,526
3,590,300	3,589,931	3,589,604	50 : 3,589,409	3,588,989	3,589,555
3,590,306	45 : 3,588,944	3,589,642	3,589,591	3,589,002	3,589,718
3,590,316	3,589,367	3,589,674	51 : 3,589,566	3,589,025	3,589,947
3,590,325	3,589,426	3,589,689	3,589,975	3,589,095	3,589,980
3,590,338	3,589,966	3,589,714	3,590,207	3,589,099	3,589,993
3,590,339	3,589,971	3,589,730	3,590,292	3,589,191	3,590,161
3,590,343	46 : 3,589,449	3,589,731	52 : 3,589,390	3,589,311	3,590,180
3,590,344	47 : 3,589,631	3,589,935	53 : 3,589,094	3,589,339	3,590,212
3,590,346	3,589,635	3,589,998	3,589,420	3,589,340	3,590,265
3,590,348	3,590,056	3,590,009	3,589,534	3,589,358	3,590,278
3,590,370	48 : 3,589,039	3,590,026	3,589,536	3,589,40	3,590,352
3,590,371	3,589,104	3,590,070	3,589,541	3,589,417	56 : 3,589,183

Design Patents

6 : 220,996	17 : 221,026	17 : 221,038	34 : 221,023	37 : 221,015	42 : 221,035
221,005	221,027	25 : 221,019	36 : 221,003	39 : 220,995	44 : 221,018
221,007	221,028	26 : 221,043	221,009	221,000	45 : 221,021
221,008	221,029	27 : 221,024	221,013	221,014	48 : 220,998
221,012	221,030	29 : 221,034	221,036	41 : 221,004	221,044
17 : 220,993	221,031	34 : 220,997	221,037	42 : 221,020	53 : 221,011
220,994	221,032	221,001	221,042		

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U. S. DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

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William E. Schuyler, Jr., *Commissioner*